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**APPLYING COMMERCIAL STYLE ACQUISITION
PRACTICES TO THE PROCUREMENT OF
COMMERCIALLY AVAILABLE AIRCRAFT**

THESIS

Douglas W. Humerick, Captain, USAF
Steven H. Minnich, Captain, USAF

AFIT/GCM/LSY/92S-6

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**APPLYING COMMERCIAL STYLE ACQUISITION PRACTICES
TO THE PROCUREMENT OF COMMERCIALY
AVAILABLE AIRCRAFT**

THESIS

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In partial Fulfillment of the

Requirements for the Degree of

Master of Science in Contracting Management

Douglas W. Humerick, B.S., M.B.A.

Captain, USAF

Steven H. Minnich, B.A., M.P.A.

Captain, USAF

September 1992

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Preface

The purpose of this research effort was to examine acquisition of commercially available aircraft/airframes, to identify the differences between government and commercial acquisition practices in acquiring commercially available aircraft, and to determine which commercial acquisition practices may be appropriate for the Air Force to adopt in acquiring commercially available aircraft. The ultimate goal of this research is to provide information to, reduce costs, improve quality, increase competition, and streamline the acquisition of commercially available aircraft.

Telephone interviews of domestic aircraft manufacturers were conducted to identify the barriers they faced in contracting with government agencies, identify the practices followed by the industry in contracting with commercial customers, and identify potential opportunities for the Air Force to adopt commercial acquisition practices. The results are analyzed and presented in this thesis. Further research is required to identify similar opportunities in acquisition of other commercial products.

We are deeply indebted to the many individuals who participated in the research and writing of this thesis, particularly our thesis advisors, Dr. Timothy Dakin and Lt Col Michael Heberling. We would also like to acknowledge the guidance of Major R. Wayne Stone and Dr. Rita Wells in developing the survey methodology, instruments, and analysis. We are grateful to the members of the Aeronautical Systems Center for identifying the need for this research, sharing their experience, and providing sponsorship for the research effort. Finally, we wish to thank our wives and children for their tremendous support, encouragement and understanding.

Douglas W. Humerick and Steven H. Minnich

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Abstract

This study was performed to recommend which commercial acquisition practices should be adopted in government acquisitions of commercially available aircraft. Previous studies, dating to 1972, illustrate the value of adopting commercial style acquisition practices in government acquisitions. Using commercial style acquisition practices can provide the government with lower costs and faster delivery with no sacrifice of quality. As a customer of the aircraft manufacturing community, the government must adapt to global market changes. Procedure reviews and changes must occur on an ongoing basis to take advantage of standard industry practices. Telephone interviews of nineteen top level personnel representing twelve domestic aircraft manufacturers revealed difficulties encountered in selling to the government: oversight and bureaucracy; payment practices; contract complexity; clause application; and MILSPECs which go beyond FAA certification requirements. A qualitative analysis methodology was selected and recommendations for commercially available aircraft acquisitions include the following points: creating a separate regulation to govern use of commercial practices; using commercial payment practices; requiring cost benefit analysis for MILSPECs and MILSTDs which exceed FAA certifications; removing CAS requirements; establishing a commercial advocate similar to the position of competition advocate; relying on commercial market forces to ensure the manufacturers produce at a low cost and sell at a fair price; and empowering program managers and contracting officers to keep decisions at the lowest possible level to streamline the decision making process.

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I. Introduction

General Issue

Acquisition legislation and the resulting laws, regulations, and policies are designed to protect the Government throughout the acquisition of major weapon systems. However, the laws also impact the acquisition of commercially available items, discouraging some contractors from doing business with the Government. The cost of doing business with the Government also increases for those contractors that remain. This is particularly detrimental in acquisitions involving high dollar value, low quantity, and long lead time purchases, such as those for commercial transport aircraft and airframes. These acquisitions often do not fit into the exemptions and policies developed to purchase smaller commercial items. Consequently, these purchases are often subject to the full force of the policies, regulations, and laws that were designed for development and acquisition of specialized military equipment. Attempting to acquire commercial items in this manner presents significant barriers for commercial firms to do business with the Government.

Numerous studies have recommended that DOD adopt commercial style acquisition practices to overcome these barriers; cut costs; improve competition; and increase the supplier base capable of and willing to do business with government agencies. In the case of aircraft manufacturers, there are a limited number of firms that can supply our needs. Many of these businesses have little, if any, interest in conforming to the lengthy regulations and requirements for a one time or small quantity buy. Changes in

current procurement practices are required to effectively and economically acquire these commercial resources.

Background

Adopting commercial acquisition practices and procurement of commercially available items for DOD use has been a recurring subject for debate since the early 1970s (31:2).

The 1972 Commission on Government Procurement called for the 'businesslike' operation of federal procurement. The 1984 Grace Commission sought to apply 'private sector management tenets' across the entire federal government. More recently, the Packard Commission and the 1986 Defense Science Board (DSB) noted the potential advantages of adopting commercial practices in the Department of Defense. (44:v)

In May 1976, the recommendations of the COGP [Commission on Government Procurement] became policy when OFPP [Office of Federal Procurement Policy] issued a policy memorandum stating that:

The Government will purchase commercial, off-the-shelf products when such products will adequately serve the Government's requirements, provided such products have an established commercial market acceptability. The Government will [use] commercial distribution channels in supplying commercial products to its users.

This policy called for a change in philosophy and distribution cost by:

- (1) stimulating competition;
- (2) taking advantage of industry's innovativeness and technological advances;
- (3) avoiding specification development costs; and
- (4) reducing risk and costs associated with the storage handling, and shipment of goods. (23:21-22)

The effectiveness of this policy declaration is questionable considering the impact of increased Congressional oversight and the findings of the 1986 Packard Commission. These findings included a recommendation that DOD adopt commercial style acquisition practices to cut costs and improve competition. This recommendation came ten years after the policy was announced, illustrating the lack of effective change.

Jacques S. Gansler, in his book *Affording Defense*, points out, "Although Congress has also been the source of many speeches in favor of greater use of commercial products and of much mockery of military specifications, it passed the laws that *require* the DOD to do business in its present manner" (19:193). Although the underlying benefits of applying commercial style acquisition practices are generally agreed upon, especially on large dollar value procurement such as aircraft, changes to policy have proven to be a long and arduous process. Efforts to increase use of commercial practices have also been countered by increased Congressional oversight. Since the Vietnam era, Congressional oversight has grown due to reports of cost and schedule overruns. Intervention has often been short sighted with laws being passed for immediate purposes. The long-term affects on the acquisition process were not usually considered.. Gansler states that during the 1980's, Congress was passing "procurement reform legislation" at a rate of nearly 150 bills per year (19:153). While the majority of this legislation is directed at weapons system procurement, there is a direct impact on the acquisition of commercially available products. "There is a growing belief that as the Government continues to tighten its grip on both contractors and subcontractors through congressional legislation, firms will be squeezed out of the supplier base, unable and unwilling to compete for DOD business." (24:45)

"Numerous reviews of the acquisition system, including the Packard Commission's, have found that the system is encumbered by overly detailed, confusing and sometimes contradictory laws, regulations, directives, instructions, policy memoranda, and other

guidance" (5:11). While Congress can be given much of the credit, much of the responsibility rests on DOD in its implementation of legislative requirements and self generated administrative burdens. Legislative action will be required to alleviate many of the barriers, but the DOD must take immediate action (5:11). Reinforcing Mr. Cheney's remarks that DOD must take the first step, the Air Force and DOD have met significant resistance when requesting relief from current acquisition laws, regulations, and directives. The General Accounting Office, in hearings before Congress, has recommended that Congressional relief be denied because requests have not been specific enough.

DOD contends that existing laws and regulations make it difficult to acquire commercial items in the same way as a commercial buyer. We would not be opposed to removing impediments that may be preventing DOD from buying more commercial products. However, as in the case of the pilot program, DOD does not identify the specific laws that impede its ability to do so. DOD needs to demonstrate what is wrong with the existing laws before the Congress can decide what legislative changes are needed. (28:8)

Research Problem

The purpose of this paper is to examine commercial acquisition of aircraft/airframes; to identify the differences between government and commercial acquisition practices in acquiring commercially available aircraft; and to determine which commercial acquisition practices may be appropriate for the Government to adopt in acquiring commercially available aircraft.

Investigative Questions

The research problem will be addressed through the following investigative questions:

1. What are commercial practices in the commercial aircraft industry?
2. What are the Government practices in acquiring commercial aircraft?
3. How do commercial practices differ from government acquisition practices?
4. What do contractors perceive as barriers to doing business with government agencies?
5. Based on the contractors' responses, which commercial practices should the Government adopt? (What are the benefits of adopting commercial practice to the contractor and to the Government?)

Definitions of Terms

Commercial Item - An item (hardware or software) regularly used for other than government purposes which, in the course of normal business operations: (a) has been sold or traded to the general public; (b) has been offered for sale to the general public at established prices but not yet sold; (c) although intended for sale or trade to the general public, has not yet been offered for sale but will be available for commercial delivery in a reasonable period of time; (d) is described in (a) or (b) or (c) and would require only minor modification in order to meet the requirements of the procuring agency (9).

Minor Modification - A modification that does not alter the performance or physical characteristics of the item (9).

Commercial Practices - Generally accepted industry acquisition practices based on the Uniform Commercial Code.

Commerciality - Extent to which an item is commercially available.

Commercial, Off the Shelf (COTS)- Term used by the Air Force to describe Non-Developmental Items (12:4).

Barriers - Those acquisition laws, regulations, requirements, and practices that are defined herein that, by their presence, prevent, dissuade, or limit aircraft manufacturers from doing business with government agencies.

Missionized - Modifications to aircraft to make it suitable for the intended purpose, i.e., adding appropriate seating, radios, communication equipment required for a Congressional transport.

Militarized - Modifications to make the aircraft suitable in a military environment, i.e., installing nuclear blast shielding.

Non-Developmental Item (NDI) - Term used by the Army, Navy or Marine Corps to describe: 1. Any item of supply that is available in the commercial market place; 2. Any previously developed item of supply that is in use by a department or agency of the U.S., a State or local government agency with which the U.S. has a mutual defense cooperation agreement; 3. Any item of supply described in paragraph 1. or 2. that requires only minor modification in order to meet the requirements of the procuring agency; or 4. Any item of supply that is currently being produced that does not meet the requirements of paragraph 1., 2. or 3. solely because the item: a. is not yet in use; or is not yet available in the market place (22:3,4).

Uniform Commercial Code (UCC) - The body of law which is found in common law and "based on custom, usage, and reason and reflected in judicial pronouncements" (48:B-3). It is the body of law that has been adopted by almost every state to govern business. Louisiana is the only exception.

TINA - Truth in Negotiations Act.

CICA - Competition in Contracting Act.

OSHA - Occupational Safety and Health Administration.

Scope of Research and Limitations.

The current state of use of commercial practices in Air Force acquisition and the barriers to doing business with the Government will be identified through case studies of recent purchases of commercial aircraft; a review of current literature; and telephone interviews with representatives of U.S. aircraft and airframe manufacturers. Current laws, regulations, and policy will be examined for opportunities to introduce commercial practices to eliminate those barriers through contracting officer discretion, Air Force policy changes and DOD policy changes. Those barriers that are beyond local or agency authority will be identified. The legal bases for these barriers, the risks to the Government upon their removal, and the potential benefits will be presented as a framework for potential executive or legislative action.

Although the scope of this analysis is primarily limited to the acquisition of commercial aircraft and airframes by the U.S. Air Force, all branches of the Department of Defense, and to a lesser degree, all agencies of the federal government are governed by the same acquisition laws and regulations. Consequently, the results of this research should be applicable and valid for these entities, provided agency specific requirements are evaluated. Although the scope is also limited to commercial aircraft and airframes, the research may have application in other industries, but broader inferences would require individual analysis of other commodities or industries.

II. Literature Search and Review

Introduction

The purpose of this literature review is to discuss barriers, real or perceived, aircraft manufacturers encounter when conducting business with the Government. More specifically, this review examines the history of commercial acquisition practices employed by the DOD; laws, regulations, directives, and policies which make the Government a less than desirable customer; and the composition and practices of the US commercial transport aircraft industry.

Justification

Adopting commercial acquisition practices and procurement of commercially available items for DOD use has been a recurring subject for debate since the early 1970s (31:2).

The 1972 Commission on Government Procurement called for the 'businesslike' operation of federal procurement. The 1984 Grace Commission sought to apply 'private sector management tenets' across the entire federal Government. More recently, the Packard Commission and the 1986 Defense Science Board (DSB) noted the potential advantages of adopting commercial practices in the Department of Defense. (44:v)

The Government imposes certain requirements and restrictions on contractors and the contracts they enter. These requirements may present barriers to contractors desiring to enter into contracts with government agencies.

There is a growing belief that as the Government continues to tighten its grip on both contractors and subcontractors through congressional legislation, firms will be squeezed out of the supplier base, unable and unwilling to compete for DOD business. (24:45)

Although the underlying benefits of applying commercial style acquisition practices are generally agreed upon, especially on large dollar value procurement such as aircraft, changes to policy have proven to be a long and arduous process.

The general perception is that the existing government procurement system has become ponderous and non-responsive, that it is too expensive, and that some very basic reforms are overdue. The adoption of commercial buying practice is looked upon by many as the keystone of these needed reforms. (42:54)

Although reform is necessary, some changes may be easily accomplished by using current provisions. Eliminating all but the essential contract clauses is one step to adopting commercial practices.

It would represent a major leap in government contracting practice to adopt commercial style contract paper outright. However, the judicious application and tailoring of existing FAR contract provisions is more readily achievable. (15:449)

The Federal Government did not establish a formal policy concerning acquisition of commercial products until 1976, four years after recommendation by the 1972 Commission on Government Procurement (31:3). Increased visibility and impetus to adopting commercial style practices was provided by the Packard Commission's Final Report in 1986.

However, as things now exist, there are burdensome impediments to the acquisition process, which greatly discourage the use of commercial equipment and practices. Despite these impediments, the DOD has demonstrated significant commitment to procuring commercial equipment in cases where operational requirements and supportability concerns could be satisfied. For example, of 556 active procurement programs in the Army, 182 are being satisfied with non-development items. To greatly increase the use of commercial systems, subsystems and components it is essential that relief of the impediments be addressed. (3:36)

Increasing the use of commercial style acquisition practices in the Air Force is beneficial in the current state of draw downs and cutbacks. Commercial practices can provide government agencies with lower cost systems without affecting quality.

In a period of dwindling defense budgets and public attention on the relationship between acquisition lead time and weapons systems cost estimates, the acquisition of commercial products [and use of commercial practices] becomes increasingly attractive. (18:1)

Organization of Discussion

The United States commercial transport aircraft industry is examined to provide its demographics and factors, reinforcing the use of commercial practices in government acquisition. Standard commercial contracts are compared to government contracts to examine which clauses are similar and which clauses impose additional restrictions on the manufacturer. A discussion of barriers to contracting with the Government uses examples from past contracts, current source selection processes, and government specific requirements. The laws, regulations, directives, and policies creating the barriers are discussed last. Included in this section are those laws, regulations, directives, and policies currently targeted to reduce the barriers.

Discussion of the Literature

Commercial aircraft have been used by the military for some time. The AWACS, the Airborne Command Post, the KC-10 refueler/transporter, and Guardrail are examples of successfully adapting a commercially available aircraft to accomplish military missions (3:12). "Although the increased use of commercial equipment is good, the increased use of commercial procurement *practices* could be even better" (3:iii, 61). The amount and nature of the benefits of adopting commercial acquisition practices are dependent upon the way in which the policy is implemented (31:3).

To effectively implement commercial acquisition practices appropriate to the commercial transport aircraft industry, the nature of the industry must be considered.

US Commercial Transport Industry. The US commercial transport aircraft industry currently services both private and public customers. Generally, the only difference between a privately purchased aircraft and a government purchased aircraft is the operating environment. Commercially available aircraft are competitively priced to maintain standing in the marketplace. Rapid technological changes in the commercial

world, for example, electronics, offer a rich potential for DOD exploitation with potential gains in performance, quality, and schedule at lower costs (3:vii).

The DOD does not always take advantage of these technological advances. An aircraft which serves both commercial and military purposes, such as the C-130, may advance technologically in the commercial sector, but remain virtually unchanged in the military sector due to configuration controls.

Demographic Portrait. There are currently only thirteen manufacturers in the United States which produce commercial aircraft as shown in Table 1 (49:135-174). These manufacturers sell to corporations; private individuals; airlines; foreign, state and United States Governments; and the DOD. Having such a large commercial market makes federal agencies, such as the DOD, less attractive customers due to the stringent requirement imposed by law and regulations. This is especially true when government agencies comprise only a small portion of the manufacturer's business. It is prudent for the Government to minimize contractor's barriers to maintain a competitive supplier base.

These aircraft manufacturers have their individual market niches. Manufacturers produce aircraft types ranging from executive transports to large cargo aircraft available to both government and commercial customers. Many base a large part of their annual income on selling spare parts and servicing aircraft.

Factors to Reinforce The Use of Commercial Practices. There are various factors and advantages to consider when using commercial practices in acquiring commercially available aircraft. Purchasing a commercially available airplane should be as easy as purchasing a car--it requires no further development for use and there are easy contracts to use.

TABLE 1
U.S. Commercial Transport Industry

<u>Manufacturer</u>	<u>Business Description</u>
Beech Aircraft Corporation	Designs and manufactures general aviation and commuter aircraft, military training and transport aircraft, air-to-air refueling systems, remote controlled subsonic and preprogrammed supersonic missile target systems
The Boeing Company (including specialty divisions)	Manufactures aircraft, aerospace, defense, computer, and electronic products
Cessna Aircraft Company (subsidiary of General Dynamics Corporation)	Manufactures propjet and twin-fanjet transport aircraft
Douglas Aircraft Company (Division of McDonnell-Douglas Corporation)	Manufactures transport aircraft
Fairchild Aircraft	Manufactures pressurized twin turboprop aircraft for regional airlines, corporations, small package express, and military/government applications
Falcon Jet Corporation (subsidiary of Dassault Aviation)	Manufactures business and corporate jet aircraft
Grumman Aircraft Systems Division	Manufactures aircraft; subcontracting; aircraft overhaul and modification
Gulfstream Aerospace Corporation	Manufactures corporate and government liaison jets
Learjet, Incorporated (subsidiary Bombardier, Incorporated)	Manufactures and modifies corporate and commuter aircraft
Lockheed Corporation (including specialty divisions)	Manufactures and services military propjet transport and commercial cargo aircraft; modifies commercial aircraft
North American Aircraft Operations (U.S. division of Rockwell International Corporation)	Research, development, and production of military and commercial aircraft; major structures subcontracting
Piper Aircraft Corporation	Designs and manufactures propjet and piston-powered business and general aviation aircraft
Saberliner Corporation	Manufactures business jet aircraft and parts; aircraft modifications; avionics systems integration; maintenance and overhaul

(49:135-172)

Non-Development Item. The main advantage of a commercially available aircraft is that it requires no development. The manufacturer has already undertaken the expense to design and develop the aircraft. The research and development costs already incurred by the manufacturer are factored into the delivery cost of the aircraft.

The assembly line is already established (minimal retooling may be required to accommodate special requirements) and producing the aircraft. In some cases, the manufacturer may have several versions of the aircraft available providing a choice of models.

With the aircraft already in production, the DOD has the unique advantage of being able to *test drive* the aircraft. The ability to *fly before you buy* also enables the DOD to compare aircraft from several manufacturers before selecting one for purchase.

FAA Certified. Since the aircraft is available to the public for use, it has already been certified by the Federal Aviation Administration (FAA). FAA standards ensure the safety and airworthiness of the aircraft. The FAA certifies the aircraft to certain performance standards such as altitude, speed, and lift. These certifications can be used in the source selection of the aircraft.

Market Driven Prices. The market drives the price of a commercially available product. With suitable substitutes available in the open market, the manufacturer must ensure that its price is competitive to all other manufacturers of similar type aircraft. To keep the price competitive, the manufacturer must ensure it operates at the lowest possible cost. In a commercial sale, the seller convinces the buyer that a product is a better value than all alternatives (42:55). Not only does the seller emphasize the positive aspects of the aircraft, the competition emphasizes the negative aspect. This extended data set of information provides the source selection authority with a better opportunity to choose the best value for the money.

Standard Commercial Contracts. Aircraft manufacturers typically use *fill in the blank* type contracts. Blanks are provided for quantity, delivery date, financing, price, etc. The customer simply chooses the aircraft and delivery date. Contract clauses are added to include the buyer and seller interests in the sale. "The simplified uniform contract must contain only such clauses as are essential for the protection of the Federal Government's interest" (34:14).

The Government includes clauses which protect itself and the taxpayers. Many of these clauses are unnecessary since standard commercial practices require the same or better performance for the manufacturer to remain viable in the industry.

Commercial practices, studied in depth about the Boeing 767 acquisition, have some significant differences from DOD acquisition practices. Here is a list of key commercial practices. They use functional requirements, and select sources based on past performance, quality of product, management, and financial strength. Protests are limited to personal entreaties, there being no process in the Uniform Commercial Code (UCC) for protests. *Best value* to the program is the selection criteria for a source, rather than lowest cost. An adapted UCC is employed which is quite simple as compared to DOD contracts. Schedule is paramount, and resources--in terms of money and people--are planned to solve problems in an effort to hold schedule. The program manager has very great authority and responsibility. His review levels are very few--2 or 3 at most. (3:10)

Standard contracts have been used in the military with some success. The Air Force, Navy, and Army have all adopted standard contracts in some areas. The standard contract is shorter and easier to understand.

The Air Force's 'MIL-PRIME,' and the Construction guide Specifications used by the Army and Navy are examples of 'fill-in-the-blanks' type specifications which achieve this goal while providing maximum tailoring flexibility. The MIL-PRIME specification for landing gear is 13 pages long and contains two references. It replaces 13 specifications with their 256 references previously used to buy landing gear. An appendix to the MIL-PRIME specification contains 170 pages of 'lessons learned' and guidance regarding application of requirements. Because of the clear benefits, we recommend that development and use of this kind of specification be accelerated and adopted DOD-wide. (3:40)

MIL-A-87221 (USAF) deviates from standard MIL-STD-490 practices by providing numerous blanks to be filled in for specific aircraft procurements, and in providing voluminous background materials and lessons learned in appendices. (27:12)

Commercial Warranties. Commercial aircraft, like automobiles, have a warranty when purchased. This warranty is factored into the price of the aircraft. The warranty covers the basic aircraft based on time, use (flying hours), or some combination of both. The commercial warranty ensures the manufacturer is producing a quality product.

One area of the commercial process that is consistently bantered about is the concept of using commercial warranties. The SPO position is that the standard commercial warranty, which is priced into the aircraft, is appropriate in the same sense that acquiring the standard automobile warranty is appropriate when negotiating a new car deal. Contractors cannot be expected to build quality into an existing aircraft. We have found that contractors are positively incentivized to negotiate optimum commercial warranties with their vendors as the majority of the contracts awarded out of SDC are awarded simultaneously with a contract providing for full Contractor Logistics Support (CLS) for up to five years. So, should a contractor build what amounts to a lemon, a liquidated damages clause included in the CLS contract forces the contractor to reimburse the Government for travel expenses incurred by the user due to the inability of the aircraft to fulfill the mission. Cost savings based on these enhanced commercial warranty provisions are passed along to the Government, thereby improving the contractor's competitive position while reducing the cost to the Government. (18:7)

Not all warranties are alike. Each manufacturer builds its own warranty to entice a purchaser. Warranty provisions may vary between aircraft type and even between customers.

Commercial airplane warranties may vary considerably for reasons such as competitive pressures, past relationships between manufacturer and buyer, or operators maintenance capability. Commercial warranties may cover periods ranging from one year on equipment defects to several years on structural service life. Reputable suppliers are a must for successful warranty programs and an important consideration in the selection of suppliers for commercial programs is the warranties they are willing to give the manufacturer. (4:19)

A warranty on a government purchased aircraft may be a reduced version of the manufacturer's standard commercial warranty. The standard warranty is reduced to meet

the demand of low bid acquisition or because of reduced government requirements in warranty provisions.

The standard warranty for a military airplane is a Correction of Deficiencies agreement whereby the manufacturer agrees to correct those deficiencies which become apparent during the first few months after delivery. The manufacturer acts as the sole interface with the Government for the complete airplane, excepting government-furnished equipment. This procedure for military programs is in accordance with ASPR requirements. The reduced cost benefits of direct supplier warranties, as realized in commercial practice, are thus lessened by military procurement regulations on military programs. Warranty benefits to military programs are also reduced by the competitive, 'low bidder' environment which constrains manufacturers and suppliers. (4:19)

A manufacturer warranty is an attractive and valued feature to consider in source selection. The DOD does not always take advantage of warranties when purchasing aircraft.

Warranties cannot be relied upon to overcome all impediments to buying commercial; however, [DOD's] current capabilities to administer warranties need to be enhanced to take advantage of commercial warranties. Of course, standard commercial warranties may need to be contractually adjusted to make them operable in actual operating environments. (3:50)

Barriers to Contracting With the Government. Aircraft manufacturers encounter several significant barriers in doing business with the Government. Some of these barriers may preclude a manufacturer from submitting a response to a request for proposal.

A survey of 1317 manufacturers yielded 427 responses in a 1986 study. Of the 427 respondents, 91 did not want DOD business and 122 wanted DOD business but had some type of dissatisfaction. Of the 59 respondents working in the area of aircraft equipment, seven did not want DOD business and 15 wanted DOD business, but had some type of dissatisfaction.

Dissatisfiers were arranged by most frequent to least frequent with the number of respondents citing a particular problem as first or second choice. The most commonly stated problem with government requirements was burdensome paperwork (147 responses or 69 percent). Other areas of dissatisfaction included government bidding methods, 56.8 percent; inflexible procurement policies, 38 percent; more attractive commercial ventures, 34.3 percent; low profitability, 32.4 percent; government attitude(s), 32.4 percent; inconsistent quality requirements/standards too high, 22 percent; audit procedures, 14.6 percent; unfair application of regulations, 14.1 percent; technical data rights problems, 12.6 percent; and other (entered by the respondent), 21.6 percent. (24:46-49)

Other barriers to entering business arrangements with government agencies include unwieldy overstated government specifications; weighty record keeping requirements; additional inspection and testing beyond what is required for FAA certification; and burdensome contractor financing requirements. The impact of these items may be minimized by implementing a commercial model in government acquisitions.

The federal Government imposes oversight provisions to ensure high quality and low cost. The true value of extensive government oversight and regulations is questionable.

The military does not necessarily obtain a better quality product as the result of more controls, regulations, specifications, and excess documentation. There is general agreement that use of 'how-to' military specifications should be closely examined for specific program application before being imposed upon a military derivative program. (4:18)

Examples from Previous Contracts. The Aeronautical Systems Center (ASC), Wright-Patterson AFB, OH, purchases transport aircraft for the Air Force. Some commercial practices were used in procuring the Air Force One.

In a recent purchase of an Air Force C-20, the military equivalent of the Gulfstream IV, a 12 passenger commercially available jet aircraft, the manufacturer requested a waiver of the Government's required cost accounting system and a payment

procedure which reflected those of a private customer. The waivers were granted only after nine months of conversation, correspondence, and negotiation (1).

The company's (and the contracting officer's) reasoning for requesting the waivers was that the aircraft was already FAA approved; the aircraft was currently assembled on a commercial production line; several aircraft had already been purchased by the various branches of the military; implementing a government approved cost accounting system would be too costly; and the standard government payment procedures would require manufacturer financing which would substantially increase the cost of the aircraft.

Examples From Current Source Selections. The office directly responsible for these purchases, ASC/SDCK, is currently attempting to adopt commercial practices through its source selection process.

Some government needs are not suitable for conventional formal advertising because available specifications are inadequate. This may occur when the requesting agency is not fully conversant with the best way to satisfy a particular need. In this instance, buyers may [use] a 'two step' procedure, whereby technical proposals are solicited and subsequently evaluated to eliminate those which are inadequate; limited negotiations may be conducted at this point in the process. This situation ... often involves products of known configuration and performance characteristics which have to be 'fitted' to a particular need. The purchase contract is awarded to the vendor whose bid is most advantageous to the Government--price and other factors considered. This decision may result in a firm price or in a price which can be adjusted if certain economic conditions develop. (41:8)

This process of soliciting information before issuing a formal request for proposals occurs when the Air Force seeks to purchase a commercially available aircraft for modification to mission needs. Already knowing that government oversight and progress payments may preclude an aircraft manufacturer from conducting business with the Government, ASC/SDCK sought to address these areas before issuing a request for proposals to acquire the new executive transport aircraft.

Executive Transport Fleet. In the early part of 1992, ASC/SDCK prepared for the source selection of the United States Air Force Executive

Transport (VC-X) fleet. The VC-X Special Air Mission Program is to replace the current VC-137 fleet, whose mission is "to transport the Vice President, US Cabinet members, Congressional delegations and foreign dignitaries throughout the United States and overseas on official duties" (17:2). The planned contract award is February 1993 (17:2). The purchase has since been placed on hold, but responses to the solicitation for information illustrate how aircraft manufacturers feel commercial practices can be used by the Government.

Solicitations for Information. One of the strategies of the acquisition is to use "commercial procedures ... [to] ... acquire and modify the aircraft to the maximum degree possible" (17:4). A Solicitation for Information (SFI) was issued to obtain a commercial model to use in the potential request for proposals and the subsequent contract award. The SFI document sought information from each of the interested contractors as to what commercial practices they wished to see employed in the execution of the contract. The document requested information concerning government oversight and commercial payment procedures. Specifically, the document asked what an acceptable level of government oversight would be; it also requested samples of commercial payment procedures used by each company (17:4).

Responses to SFI. Four manufacturers responded to ASC/SDCK's solicitation for information: Chrysler Technologies Airborne Systems, Inc.; Boeing Defense & Space Group; McDonnell Douglas; and E-Systems. Excerpts of the individual responses are provided, with permission from the contractors.

Oversight. Chrysler felt that government oversight should be reduced. "To obtain the resulting cost and time savings, [the Government] must recognize the 'traditional' methods of oversight are inappropriate" (39:7).

- A. Using the commercial approach to acquisition, the Quality Assurance provided by the manufacturer, vendor, and FAA certification provide more than adequate oversight.
- B. The expensive part of Quality Assurance is the multiple inspection of the same item, often asking inspectors to inspect areas in which they are not familiar.
- C. An acceptable level of government oversight would be for the Quality Inspector to be on site to inspect those areas designated critical or of special interest. [Otherwise] the Government inspector could take random samples of the completed work.
- D. The most time consuming factor that increases cost (without added value) is the Government inspector accomplishing inspections on items that have been inspected two or three times before. This way of doing business is very expensive, and creates poor working relations. (39:5-6)

Boeing suggested that the contract clearly identify what agency, FAA or Air Force, is the final approving authority in the technical area (45:Enclosure A, Part 1:5). The Air Force should not involve itself in any matter already required by the FAA or [the Federal Aviation Regulation]. Only valid, mission essential requirements which have no commercial equivalent in the [Federal Aviation Regulation] should be reviewed using inspection and testing procedures appropriate for the item being purchased. Boeing further recommended that "the contract SOW specifically identify all contractor services that are required to support necessary government oversight" (45:Enclosure A, Part 1:5).

McDonnell Douglas suggested that "oversight should be minimal due to the commercial environment" (14:1). It was their belief that the aircraft and its production process are already proven to be cost effective since it competes in the open market. They also believed that oversight and certification provided by the FAA should be adequate to meet Air Force and FAR requirements.

E-Systems stated that "in a commercial application, if the specifications, policies, and procedures do not add value, then do not invoke [them]" (7:B-21). For instance, the candidate aircraft already meets or exceeds FAA requirements for safety and

airworthiness. There is no need to invoke any procedure which goes beyond these requirements.

DFARS 211.7004-1(f) provides for tailored inspection requirements for systems designated as critical. This tailoring must be done early in the program. Boeing believes that DFARS 211 procedures accommodate oversight of any contractually required service (45:Enclosure A, Part 1:5). Chrysler believes that inclusion of MIL-I-45208A should be permissible under FAR/DFARS 211 (39:6).

General Electric (GE) notes that what continues to differentiate commercial from military customers is administrative practices, in particular the increasing demands for audits, cost and pricing data, subcontractor audits, and government reporting requirements. For each of the Government representatives assigned to just one of its engine programs, GE provides approximately two employees to handle administrative demands, at a full cost of approximately \$100,000 per worker-year. This kind of oversight costs GE an extra \$3 million per year and the U.S. government \$4.5 million per year, that is, combining costs of both contractor (\$3 million) and government (\$1.5 million). (46:19-20)

Commercial Payments. Typical government progress payments are based on costs incurred in the production of the acquired item or service provided. The manufacturer is reimbursed 85 - 95 percent of costs incurred on a monthly basis with the balance paid upon item acceptance (9:232.501-1). In typical commercial payments for the same aircraft in the commercial aircraft industry, "35 percent is the advanced payment, with 1 - 2 percent paid on the execution of the contract, another 4 percent within 24 months, then 5 percent per month thereafter until 35 percent is achieved" (7:B-25). The remaining funds are withheld until aircraft delivery as incentive for contract performance.

Standard payment procedures are frequently used primarily because the effort to develop a commercially applicable payment procedure, based on milestone billing, has yet to be undertaken (18:8). With the introduction of DFARS 211, Commercial Acquisition Procedures, progress payments are unacceptable.

Contracting Officers shall not provide for customary or unusual progress payments when contracting for commercial items. For the purpose of this subpart, the term standard commercial items as used at FAR 32.501-1(c) includes commercial items requiring minor modifications to meet the requirements of the procuring agency. (9:211.7004-1(m))

The Gulfstream IV purchase was the first contract which attempted to approximate a somewhat commercial payment procedure through modified milestone payments. Without some form of progress payments, total contractor financing is necessary, adding to the total cost of the procurement and making government business less attractive.

The responding contractors suggested having government payments more closely match those of a commercial customer. Chrysler proposed relatively large 'upon completion' payments, similar to milestone payments, to encourage the aircraft manufacturer's performance. These payments include a down payment; progress payments (actual costs + 10 percent of the maximum due) at 60, 90, and 150 days after contract execution; and the balance due upon completion (39:8). This type of payment provides the manufacturer with a portion of profit during the production process.

Chrysler proposed similar payments for required modifications to the aircraft to configure it to military specifications. These payments include predetermined payments at certain goals. A down payment (25 - 30 percent) is due at aircraft delivery to the modifying contractor; additional payments at 60 and 120 days from said delivery; and the balance due at redelivery of the aircraft to the prime contractor (39:8).

Boeing proposed a more elaborate payment schedule based on the 'advance payment base price' and scheduled delivery month of the aircraft.

Since the price of the aircraft is subject to escalation, payments are based on the estimated escalated price of the aircraft at time of delivery. The advance payment base price is reset 25 months prior to delivery to reflect the latest escalation forecasts. A deposit is due upon proposal acceptance; one percent of the base price, less the deposit, of the aircraft is due upon contract execution; four percent of the base price is due 24 months prior to the first day of the scheduled delivery month of the aircraft; five percent of the base price is due at 21, 18, 12, 9, and six months prior to the first day of the scheduled delivery month. This totals to 30 percent of the advance payment base price. (45:Enclosure A, Part 1:6)

McDonnell Douglas based milestone payments on the advance payment price and the delivery date of each aircraft.

Five percent of the advance payment price is due at contract execution; five percent is due on the first day of each of 24, 21, 18, 15, 12, and 9 months prior to delivery of the aircraft; and the balance is due at delivery. This totals to 35 percent of the advance payment price. (14:Atch 3)

It is notable that neither Chrysler, Boeing, nor McDonnell Douglas mentioned the actual amount of work performed on the aircraft in determining the payment amount. The payments are linked only to time in production.

E-Systems, primarily a communications and aircraft modifications contractor, proposed a combination of commercial payments in addition to the customary government progress payments. "Commercial payments should be associated with the acquisition of the direct source aircraft -while progress payments should be used on the rest of the program" (7:B-25).

Examples of government Specific Requirements. The government imposes various restrictions on both contracts and personnel. Contract restrictions are intended to protect the Government; personnel restrictions are to protect the Government and provide a trained, well-rounded, professional work force.

Personnel Instability. The nature of moving personnel for career progression also precludes the 'one face' to the seller. government personnel are career motivated rather than project oriented and generally change jobs every two to three years. Each move begins the process of establishing the trust between the contractor and

the new contracting officer. There is little or no overlap between the old and new personnel. The contractor is often tasked with indoctrinating the new person to the program.

Closer buyer-seller relationships are a necessity if US companies are to succeed in the global marketplace. Relationships must be long-term and offer mutual benefits to both parties. These benefits include: simultaneous engineering on new products; quality improvement; and more efficient delivery arrangements. (20:185)

With personnel changes comes a familiarization stage, when the contractor and new person gain each other's trust and confidence. Performance on the program may be hindered due to the break in personnel continuity.

The commitment or trust necessary for a close buyer/supplier relationship can manifest itself through: collaboration on production schedules; technical assistance; joint problem solving; the general sharing of information; openness on the cost of operations; long-term contracts; capital investments; and installation of electronic data interchange. (20:185)

Mandated Certified Cost Accounting System. Standard progress payments on a government contract are currently based on the amount of cost incurred by the contractor in performing the contract. These costs must be tracked using a government-approved cost accounting system (CAS). CAS is costly to implement and may cause contractors to shy away from government contracts. Without a certified CAS, the contractor is unable to receive progress payments unless granted a waiver to this requirement.

The cost accounting standards define a standard accounting format for government contracts, providing guidance on anything from how to account for the cost of money, to depreciation of capital assets, to allocation of general overhead. Some of these standards differ appreciably from generally accepted accounting practices in the commercial sector. . . . The problem is that a growing number of commercial companies are unwilling to invest the money and effort for what amounts to a relatively small, erratic, and lower-profit portion of their business. (46:31-32)

The CAS requirement flows down to subcontractors. For reasons mentioned above, the contractor may find that some subcontractors working on commercial projects do not wish to invest the money to work on government projects, too.

Two other items are of interest here. First, the standards are applied on a contract-by-contract basis, not on a company-by-company basis. This tends to spread the net beyond the large defense contractors for whom they were originally intended. The requirements for compliance often flow down to largely commercial subcontractors like Intel (because the prime contractor may be asked to justify its costs to DCAA auditors). Hence, commercial companies that supply components or material to defense contractors often have to establish a CAS-compliant system. Second, there does exist a provision in the regulations to cover the commercial contingency, the limited ("modified") CAS coverage. Companies that can meet the so-called 10/10/10 test--a contract for less than \$10 million to a business unit with less than \$10 million in national defense contracts, if those sales were less than 10 percent of the business unit's total sales--must only comply with the first two CAS standards. These require consistency in whatever internal cost accounting system is used and that each type of cost is allocated only once. A disclosure statement describing the accounting system must be submitted and updated each time an accounting change is made, no matter how minor. (46:31-32)

Cost and pricing data are believed to represent the primary means by which DOD can insure itself against contractor fraud. But one might well ask the cost of trying to pursue perfect accountability. The OTA [Office of Technology Assessment] report, *Holding the Edge*, reports that analyses by RAND and others imply that the existing regulatory regime imposes additional costs of between 10 and 50 percent on the cost of doing business with the DOD. How much fraud the regulations deter is impossible to estimate, but it must certainly be less than the \$15 to \$75 billion represented by 10-50 percent of the acquisition budget. (46:21)

The cost of implementing and maintaining a certified CAS is staggering. Not only are people dedicated to the CAS in the contractor's facilities, the Government employs people to monitor the CAS which provides additional indirect costs to the requirement. Previous studies and Congressional testimony show how staggering the cost of CAS can be.

At Pratt & Whitney, 52 people are employed to accommodate government auditors requests for accounting reports, equal opportunity reports, special purchase programs, and environmental impact statements. The organization costs the Government over \$13 million a year to maintain (including both government and company personnel). (46:19)

Boeing testified before Congress to illustrate the cost of CAS compliance. The following statements show the extent of paperwork required to comply with the CAS requirement.

'Air Force One': 1,800 pages of cost or pricing data. They identified 5,000 pages of backup information that might be required. These data covered only the modifications to the commercial 747 aircraft, which was itself exempt from certified cost or pricing data.

'Orion Update': 6,500 pages of cost or pricing data; 8000 pages of backup information identified.

'Hard Mobile Launcher': 1,900 pages of cost or pricing data; 10,000 pages identified for backup.

'Small ICBM': 2,000 pages of cost or pricing data; 7,000 pages of backup identified. (46:21)

The CAS requirement does not appear to be appropriate for commercially available aircraft. As mentioned above, the manufacturer is already driven by competition to produce at the lowest possible cost. Eliminating the CAS certification requirement and allowability reviews would certainly reduce the cost incurred in producing the aircraft. Overall, one might expect a cost reduction in the range of 10 to 15 percent [in general overhead] (46:27). These savings would be reflected in a lower cost aircraft.

Testing and Inspections Beyond FAA Certification. A common finding was that the Air Force conducts tests on each aircraft as if it were a new weapon system being entered into the inventory. Additional tests, beyond FAA certifications, are costly in terms of time and money. The FAA is a government agency which sets the standards for and evaluates the aircraft's airworthiness. Having already met these requirements, the value added by the additional testing is questionable. The additional testing appears to be intended for aircraft development.

The "aircraft will be a commercial airframe operated in a commercial environment-
-therefore, commercial standards should be cost effective" (7:B-24). "Since the basic
aircraft will be FAA certified, and in airline and military service, only mission peculiar
subsystems need be demonstrated" (14:2).

A 20 percent duplication of total testing has been estimated for military aircraft
programs. Some increase may be accounted for by peculiar subsystems but most is
believed to be traceable to military regulatory requirements. Full scale
environmental testing is much more severe for military systems despite the fact that
commercial aircraft operate world-wide under essentially the same environmental
conditions. (4:20)

Commercial standards have been used in government acquisitions in the past.
"The Navy has procured support ships to commercial standards from overseas shipyards"
(3:12). Adopting certain commercial and FAA standards would reduce the amount of
testing required by the Government. There is a similarity between the *functional*
requirements of the commercial and military user, compatibility of the environments, and
the ability of the commercial supplier to support the extended logistic requirements of the
military. (3:12)

The FAA already inspects commercially produced and operated aircraft. All parts
of the aircraft are certified to meet FAA standards. The standards and inspections
encountered to meet FAA certification should be proof enough that an aircraft is suitable
for government operations (except for certain mission peculiar modifications).

The FAA Aircraft Manufacturing Division is "responsible for the production
certification of manufacturers (all forms of production approval); original
airworthiness certification of civil aircraft; the airworthiness approval of new
engines, propellers, materials, parts and appliances; and the identification and
marking of civil aeronautical products for airworthiness control (excluding
registration); policy related to prototype article conformity inspection,
experimental certification, and related reports in support of the Aircraft
Engineering Division in the type of certification of aircraft, engines, propellers; and
enforcement of the regulations associated with all of the foregoing" (27:8).

Transfer of Technical Data Rights. In developing a system of any sort, commercial firms are concerned about handing over technical rights and data to the Government. It is the Government's contention that the Government funded the development and therefore is "entitled to rights to have it produced by the contractor of its choice" (29:18). Although this argument does not hold true when the Government purchases a commercially available product, "DOD considers obtaining rights to technical data essential to operating, repairing, and maintaining its equipment and limiting potential price gouging by sole producers who may control the market and hence the product price" (46:xii). The emphasis on transfer of data rights and the potential release of this information to competitors creates a major barrier to commercial firms doing business with the Government.

Under current regulations, a company could well lose its proprietary rights. This makes firms extremely reluctant to incorporate commercial technologies into DOD contracts. The emphasis on unlimited rights also discourages companies from exploiting the commercial opportunities of defense-supported technologies. Experience has shown that technologies that are potentially available to all companies will be exploited by none. (46:xiii)

In the past, DOD has threatened to assert its unlimited rights to some technical data in order to increase competition--a move that has been vigorously protested by industry. Commercial firms have also claimed that such threats to their proprietary data have discouraged them from selling to DOD and the military services. (40:6)

Rewriting Maintenance Manuals. In the commercial sector, aircraft are maintained by FAA certified mechanics. The manufacturer's aircraft manuals are written to be read and used by FAA certified personnel. Air Force personnel are not FAA certified. They receive their training through Air Force schools. The Air Force requires the contractor to have these manuals rewritten for use by these personnel. Contractors may not have the work force, expertise, or be willing to write the manuals to MILSPECs. The manuals are generally subcontracted at an additional cost to the procuring agency.

The preparation of Technical Manuals and related data in accordance with MILSPECs is considerably more time consuming and expensive than for their commercial counterparts and this expense is magnified by differing requirements for other services. Military publications contain more detail than required for commercial publications, due largely to the experience level of using personnel. While not universally factual, a new military aircraft system may represent a greater jump in complexity for the operational organization because the military tends to retain old equipment for longer periods than commercial operators do. (4:21)

Documentation. The government requires more documentation than a commercial buyer when acquiring an aircraft. A ten percent increase in documentation has been estimated for military aircraft programs (4:20). The requirement for this excessive formal documentation is created by an absentee, multi-layered, decision-making authority (4:18). The review levels of a program manager in a commercial firm are very few compared to those of a government program manager—two or three at most. (3:10)

Government Specifications. government and military specifications (MILSPECs) are used to ensure the item received is the item requested. "To a large degree, these specifications tell the manufacturer how to make the product, what parts to use, what processes to use, and what tests to employ" (46:21). There are numerous specifications which can be applied at the Government's discretion. "There exist 23,000 equipment specifications alone" (46:22). These specifications are intended to remove the arbitrary interpretation of the contractor and contracting officer to ensure all potential bidders receive the same instructions. Unfortunately, these specifications "do not always lend themselves to specifying technical information on generalized systems such as general specifications for aircraft structures" (27:12).

"Military specifications and standards that differ from commercial practice also offer incentives to segregate defense and commercial production and limit DOD access to the commercial state-of-the-art" (46:21). Few commercial items match MILSPECs; however, in many cases, commercial standards actually exceed MILSPECs (29:20).

One of the primary problems with government specifications is that they do not always take into account commercial sector process, often resulting in the need for separate production capability for defense goods, with the cost for that separate facility being tacked onto the price of the product procured. Besides creating extremely expensive, small-quantity prices for DOD goods, the inability to [use] best commercial practices actually has the perverse effect of introducing inferior contractors--which results in frequent accusations of contractor fraud, waste, and abuse. (46:42)

Extensive use of MILSPECs adds to the cost of a procured item (3:30-31).

MILSPECs are redundant, in some instances, when purchasing commercially available products. "DOD expends considerable resources acquiring, for a MILSPEC system, what comes free in commercial systems" (46:22).

The volume of specifications required for the design and operation of a commercial transport is contained in approximately 290 pages; the volume of specifications required by DOD for the design of a single airplane model may require 300 to 600 first-tier MILSPECs alone, and tens of thousands of pages. (23:28)

Performance specifications, commercial item descriptions, and other less rigid documentation ensure standard products, while still accomplishing the goals of quality items that fill the requirement. Where industrial standards are acceptable, they should be used. (29:20; 3:30)

Even if the item is commercially available, the cost of searching for and testing the item drives up the unit cost.

The major element of cost in avionics processors is purchases, about 47 percent of the total. Most of the purchased items are defense-unique because of unique

- parts requirements/specs;
- test/quality requirements;
- packaging requirements (hermetic sealing); [and]
- reliability/quality data requirements.

Because the unit price differentials for defense-unique parts range from 50 to 500 percent higher than similar commercial components, the most significant leverage in reducing defense product cost lies in this area. Assuming that only 35 percent of total purchases could be procured from commercial sources, a savings to DOD would still result in excess of 17 percent per unit. (46:26-27)

"The acquisition of commercial products by DOD requires a culture change from the 'MILSPEC' mentality that is pervasive throughout the Air Force" (18:1). ASC attempts to use only the essential specifications required for the aircraft's mission. ASC/SDCK develops the specification as "a joint effort between the SPO and industry" (18:2). A change, such as this, can put an aircraft on the ramp in one-third the time and at less than half the cost of similar development programs (18:1).

DOD has a long history of *make to MILSPEC* and indeed this is its basic way of doing business. It is to the credit of DOD that there are many current examples of commercial products and processes in use. To further aid DOD in pursuit of commercialization, the process impediments need to be identified and eliminated. Alleviating these process impediments will not be easy. (3:34)

Some supporters "advocate the use of functional or design specifications, calling for simplified, shortened purchase descriptions to assure maximum competition, without the need to maintain detailed Federal or Military Specifications" (23:17). Design specifications fail to consider commercial alternatives. Specifications should state what is needed rather than how to achieve performance. By allowing the contractor freedom in designing a product to meet the performance specifications, the Government may see lower costs as the contractor takes advantage of its strengths and avoids its own known weaknesses. The freedom given to the contractor should yield a more cost effective design as the contractor seeks to minimize costs and maximize profits, particularly in a fixed price contract.

As always, the first step is describing the 'need,' but we suggest doing it in a slightly different manner. Broad functional and performance requirements would be defined, withholding 'how to' specifications at this point in time. In this manner, responders would have the first opportunity to offer how they would envision satisfying the need and would be more open to suggesting tradeoffs. The tradeoff deliberations would encompass all of the cost, performance, and supportability issues, and could also allow for a more detailed and free exchange. In the case of several responders, the customer would have the advantage of considering multiple solution options.

These deliberations would consider commercial versus militarized solutions; analysis of existing product performance (if available and proven); fully discuss the capability to do early testing; and consider concepts of support from cradle to grave. (3:38)

Specifications and standards are usually necessary to describe products for acquisition (3:40). MILSPECs and MILSTDs should not be used on such a large scale. Specifications and standards should be selected and used in the contract only if they pertain to the item being purchased. Program managers and contracting officers must be granted the authority to select only the MILSPECs and MILSTDs which pertain to the item being purchased. This necessitates a reduced use of *boilerplates*, a broad collection of clauses adopted by a contracting office or agency to simplify acquisition.

Laws/Regulations/Directives/Policies. "Commercial practices used to procure commercial products are sufficiently different from DOD practices (because of history, regulations, and statute) that the expanded use of commercial products in DOD systems will be inhibited until the differences are reduced" (3:vii). The complex infrastructure of government procurement has been built over a number of years with a primary purpose being to protect the public interest and assure that public funds are properly used. As this system has developed, the multi-layered requirements that a contractor attempting to do business with the Government faces has become monumental.

[One case study] documented, for example, the additional costs in just the administrative personnel involved in administering defense procurement regulations. The study examined a model case of a company with annual commercial sales of \$10 billion and military sales of \$4 billion, whose current operating divisions are virtually all commercial or all military and whose work force stands at 100,000. What this analysis indicates is that only 8.5 percent of the work force is required to administer \$10 billion in commercial sales, but 18.2 percent of the work force is required to oversee \$4 billion in DOD sales. If the military divisions were at the same \$10 billion sales level as the commercial division, the overhead work force required would balloon to nearly 25,000, *six times more than the commercial side.* (46:23)

Government acquisitions entail large amounts of money and complex procedures. Many of the procedures are derived from laws and regulations placing stringent requirements on both the organization acquiring the items and the seller. Many of the procedures are unique to government acquisitions and not encountered in a venture between two private firms. (41:7, 8)

This vast and complex array of rules poses an entry barrier for smaller commercial business that cannot afford the necessary administrative and legal help. Larger companies, which tend to consider whether the added expense of administering government contracts is worth the effort, are increasingly coming up with a negative response. (46:65-66)

Many of the requirements are statute driven, but many are department, agency, or command generated. This section of the literature review examines the infrastructure and creation of these barriers, the role of clauses in creating barriers, and some solutions currently available.

Creating the Barriers. Procurement law is based on statutes, executive orders, decisions by administrative agencies, court decisions, and procurement regulations (48:1-6,1-7). Jacques Gansler, in *Affording Defense*, finds Congress to be a pivotal player in acquisition reform. Since the Vietnam era, Congressional oversight of government acquisitions has grown due to reports of cost and schedule overruns. Laws have often been passed for immediate purposes, with long-term effects on the acquisition process. Many of these laws now serve as barriers to the contractor base, with some contractors hesitant, if not unwilling, to do business with the Government. While Congress has been the source of many speeches in favor of greater use of commercial products and of mockery of military specifications, it is the primary source of laws under which the military must do business.

Unfortunately by the end of the 1980s, Congress' oversight had gotten out of control. Congress was passing "procurement reform legislation" at the rate of over 150 bills per year. As Representative James Courter (R-N.J.) stated, "Congress is not the answer to waste, Congress is the problem. They mean well but reformers are too often the cause of what is wrong with the military." Courter was not alone in his views. Senator Nunn and some Republican senators including Pete Wilson (R-California) and Dan Quayle (R-Indiana), have also criticized Congress' role in the acquisition process. (19:108-109)

While the majority of this legislation is directed at weapons system procurement, there is a direct impact on acquisition of commercially available products. Executive orders and regulations typically implement statutory requirements; however, they may also be used to promulgate policy and have the effect of law. Decisions by the Comptroller General, Board of Contract Appeals decisions, and court decisions create case law that also serves to structure the acquisition environment. Opinions by the Attorney General, while not binding on the contractor, do bind the Government and often shape regulations and policies that impact government contractors. (48:1-7,)

Interpretation and agency implementation of procurement law can act as a barrier, as demonstrated by the implementation of the Competition in Contracting Act (CICA).

One of the points emphasized in the Packard Commission report was that the DOD implementation of the Competition in Contracting Act has hindered the goal of open competition. The report emphasized that there has been a misconception that full and open competition precludes the Government from establishing qualification criteria and forces the award of a contract based on price without regard to other criteria, such as technical expertise or life cycle costs. Section 924 of PL 99-661 amends 10 USC 2305 to clarify congressional intent concerning the use of evaluation factors other than price in the award of contracts. The services are now moving toward this. For example, the Army's recent procurement of a new bayonet, which was awarded on the basis of a nondevelopmental item, was not given to the lowest bidder, but to the next to highest bidder based on performance criteria. (22:2)

Non-statute driven regulations and policies can create barriers just as problematic to current and prospective contractors. Even policies outside the scope of acquisition regulation, such as personnel policies and organizational structuring, can have an adverse impact.

The Blue Ribbon Defense Panel found that most program management organizations were too bulky for efficiency, with too many layers of decision-makers, and with final decisions usually required at Secretary of Defense level where it is impossible to obtain complete data for all programs. They also found that frequent rotation and reassignment of military personnel interrupt SPO organizations in critical program phases. (4:10)

Acquisition laws, regulations, and policies directly impact the contractor via the provisions in solicitations and the clauses in the contract.

Clauses. The Logistics Management Institute (LMI) of Bethesda, Maryland, in an analysis of the 1,090 solicitation provisions, contract clauses, and alternates existing in 1989, found that clauses may be required by statute; implement statute; support statutory or executive branch policy; have both statutory and nonstatutory origins; or have totally nonstatutory origins. If a clause is statutory, congressional, executive or agency action may be required to implement change. Nonstatutory clauses offer easier avenues for change. While not evaluating clauses as to their impact on particular types or styles of acquisition, the report found that 27 percent of the FAR clauses and 76 percent of DFARS clauses were basically unacceptable as written because of duplication, obsolescence, policy conflicts, or lack of need for the clause (25:1-1 - 1-4). While an exhaustive review of clauses is beyond the scope of this paper, the points presented by the LMI report are applicable in efforts to change the clauses and clause applicability in the acquisition of commercial aircraft.

The report of the CSIS steering committee on technology found that the problems with the clauses went beyond individual clauses, and there is a cumulative affect on the procurement process.

The problem is not only that these clauses are cumbersome or often inconsistently applied. Rather, it is that many are simply incompatible with the objective of increased efficiency and effectiveness and are thus incompatible with the objective of greater commercial and NDI procurement. All too often the Government fails to differentiate between truly defense-unique and commercial products. Too often, the detailed and expensive safeguards and requirements associated with defense-unique products are applied to commercial products as well. (46:66)

In addition to problems in the structure and application of clauses, this literature review discusses four broad categories of barriers linked to clauses. These are barriers created by the total number of clauses; clauses that are unique to government acquisition; clauses that are similar in title or intent to commercial clauses, but have substantially different content; and the requirement to 'flow' many of the requirements down to lower tier subcontractors or suppliers.

Number of Clauses. "A standard commercial contract requires about two or three pages of contract language, while a government contract might require 50 pages of contractual clauses to purchase even the simplest product" (46:65). As the products become more complex, such as an aircraft, the magnitude of this problem increases. In a report on the procurement process to the 1986 Packard Commission, Alan Polsen, president and CEO of the Gulfstream Aerospace Corporation is quoted as saying,

I personally believe that the C-20 aircraft program procurement could have been completed in a 2-3 week period instead of the 8 or 9 months spent in proposal preparation and source-selection activity. The C-20 proposal and source selection cost Gulfstream over \$1.3 million, and we delivered over 4,000 lbs. of written material and data. I'm sure the Government also incurred considerable expense in concluding this procurement. Compare this to the hundreds of customers, including foreign governments, that buy our aircraft on a 133-page detail specification and a 23-page contract! (19:181,366)

In referring to a statement by John Fluke, Jr., for the Commercial Product Acquisition Team (COMPACT), Van Opstal points out that the extent of the problem was highlighted by DOD when it reported that there are 11,000 different contract clauses in use at various "bureaucratic levels." According to Dean Rhoads, apparently referring to the same statement, there are only 15 contract clauses required by statute or executive order with approximately 400 mandatory FAR clauses and 200 DFARS clauses, but 11,000 mandatory clauses below DFARS. Only half of the FAR clauses had a counterpart

in commercial practice (38:274). The 1987 COMPACT report noted that a DOD fixed price contract may include:

- 173 clauses from FAR,
- 439 different contract and solicitation clauses in the DOD supplement to the FAR (clauses unique to DOD),
- 25 clauses in the Air Force FAR supplement,
- 76 clauses in the Army FAR supplement,
- 7 clauses in the Navy FAR supplement,
- 25 clauses in the Defense Logistics Agency FAR supplement. (46:65)

The above listing does not include clauses originating from command and subordinate agencies. There is a cumulative adverse effect on contractor response and government personnel's effectiveness.

The flow down of mandatory contract clauses, whereby each level in the procurement/contracting hierarchy adds required contract clauses to a procurement action (e.g., FAR, DFARS, and Air Force FAR Supplement), is a significant impediment, especially to the small supplier who has neither the staff nor the time to customize contracts for each procurement action. Another manifestation of too many clauses is that government contracting people, with so many clauses to use, often invoke inappropriate clauses for a particular procurement. (38:274)

Clauses Unique to Government. Dean Rhoads reported that in 1988 the Scientific Apparatus Makers Association in *Commercial Practices for Commercial Products - A Comparison of government and Commercial Contract Terms* identified the following government unique clauses as having significant potential impact as "inhibitors:"

- a. ethics;
- b. national security;
- c. testing and quality assurance;
- d. audit and cost;
- e. letter contracts;
- f. availability of funds;
- g. bid bonds;
- h. government property of sources/work on government installations;
- i. subcontracts;
- j. pre- and post award disputes; and
- k. miscellaneous. (38:273)

In further review of the literature, clauses addressing source preferences; socioeconomic programs; relations with suppliers; and inspection and acceptance were identified as significant barriers.

Source Preference. Requirements placed on a commercial contractor to use certain sources through clauses such as Buy American Act, Required Sources of Jewel Bearings, Required Sources for Miniature and Instrument Ball Bearings, Required Sources for High Purity Silicone, etc., tend to inhibit the sale of commercial or NDI products to DOD. Their reluctance to participate in government contracts is because commercial firms generally have established sources of supply for existing product lines or seek best-value sources for new items. Even though it is costly, redundant, and inefficient, when a contractor supplies both commercial and DOD customers, it typically will separate the purchasing for DOD. (46:66-67)

Socioeconomic Clauses. Numerous clauses implement laws and congressional programs designed to bring about socioeconomic

improvement. These clauses address a broad cross-section of social concerns, including clauses to improve the environment; aid and mobilize small and disadvantaged businesses; strengthen businesses located in labor surplus areas; and promote hiring of disabled and handicapped workers. These clauses place additional and often inappropriate burdens, especially in acquisition of commercial products, on contractors. "Most contractor representatives do not take issue with these clauses per se, but point out that such requirements impose a heavy paperwork burden and are not usually a consideration in doing business in the non-government sector" (38:277).

These regulations require contractors to establish affirmative action programs (apart from the programs already required of every employer by national law) and prescribe the system under which the contractor will keep records and demonstrate its compliance.

The problem for commercial items is that, because the product has already been manufactured, it is impossible to comply after the fact with these requirements. No monitoring system is in place (specific to the compliance with these affirmative action programs) to document compliance at the time of the sale. For the same reason, these clauses create flow-down problems for lower tier commercial suppliers, which are deemed to be subcontractors and hence also required to comply. (46:67)

Relations with Suppliers. Some clauses, intended to protect the Government from fraud, waste, and abuse, tell the contractor who they can and cannot hire or subcontract with, and mandate systems of oversight for these programs. Violation of some of these requirements is a criminal offense, and officers of the company may be subject to prison sentences for certain violations.

The antikickback clause requires contractors to have a surveillance mechanism over suppliers to prevent undue influence in the choice of subcontractor. The special prohibition on employment clause, which imposes criminal penalties for knowingly employing an individual convicted of defense fraud, also flows down to successive tiers of corporate suppliers. The problem is that commercial supplier relationships tend to be based on price quality, and reliability, not on their ability to police their subcontractors for the purposes of complying with government regulations. (46:67-68)

Beyond telling the contractor what the Government wants, where and when it is to be delivered, these clauses, in some cases, may also tell the contractor how it is to acquire its supplies and subassemblies.

The Competition in Subcontracting clause requires contractors to compete supplier bids on the basis of lowest price, which in the case of commercial products is inappropriate. First, source selection has generally been made by the time of the Government solicitation. Second, the commercial acquisition system is not set up to allow competition among suppliers every time a government order is received. Finally, commercial vendors do not select suppliers solely on lowest price but on a combination of factors including quality, reliability, and past performance. (46:68)

Audit and Cost. The requirement to submit cost and pricing data under the Truth in Negotiation Act (TINA) is foreign to the commercial environment. Cost and pricing data are competition sensitive, and commercial firms do not release this information to their commercial customers. This highlights a fundamental difference in government procurement. The government's primary concern, in any purchase, is the cost of an item from which a price may be derived. In commercial purchasing, the primary concern is the price of the item being purchased (38:276-278).

The government's emphasis on cost and its rights, duties, and obligations place it in a position to mandate access to a company's internal records. "No commercial firm selling to commercial customers permits customers to audit its internal records" (38:278). The role of CAS was discussed earlier, but the broad reaching requirements are readily apparent in clauses such as:

Audit Negotiation: Examination of records by the Comptroller General. As part of the cost accounting requirements, contractors may be required to open their records for examination or audit. But these clauses, when applied to government transactions with predominantly commercial companies, expose the commercial portion of the business as well. There is no apparent way to limit the scope of the audit to the books and records related only to the sales history of the Government order. (46:68-69)

Similar, but with Different Content. In addition to the list of "potential inhibitors," Dean Rhoads reported that the Scientific Apparatus Makers Association identified the following clauses as "inhibitors" because they have the greatest differences in content with their commercial counterparts. These inhibitors included Price and Payment Terms; Inspection, Acceptance, and Return of Goods; Warranties; Limitation of Liability; and Software and Data Rights. These "inhibitors," are well supported as contributing factors to barriers. Literature addressing the impact of the inhibitors has been reviewed; however, literature linked to the contractual implementation is reviewed below.

Price and Payment Terms. The differences in payment terms were previously discussed. The mechanics and the requirements to receive payment, required by clauses, are substantially different from commercial practice. The Material Inspection and Receiving Report, DD Form 250, is an impediment in at least two ways. "There are unnecessary delays in executing the quality and inspections portion of the form, i.e., getting the required signatures, [and] the invoicing and shipping portions are usually incompatible with commercial computerized systems" (38:278). When attempting to use commercial pricing, contractors will often have difficulty in complying with certifying their pricing as "commercial" or proving the "commerciality" of their product. The government also requires a "most favored customer" price, when the terms and conditions the contractor is expected to perform under do not resemble their most favored customer (38:276-277).

Inspection and Acceptance. "In-process inspection, which is the usual practice on many government contracts is not a usual practice in the commercial sector, i.e., commercial firms do not conduct in-process inspections of their supplier(s) during production. Inspections are done, if at all, during/at acceptance" (38:278). Broad rights are retained by the Government in inspection and quality assurance.

Inspection of Supplies (Fixed Price Contracts): In a commercial environment, the buyer may inspect the goods at any reasonable place or time and in any reasonable manner prior to payment or acceptance. The government, however, demands rights that far exceed those generally provided to commercial customers. For example, the Government is given the broad right to inspect in any manner or detail and as often as it likes. In addition, the contractor must maintain, for government review, records and test results of the inspection system. The extensive oversight and control by government inspectors result in increased costs beyond commercial catalog or market price. (46:68-69)

Warranties. The FAR and DFARS warranty clauses are substantially different from commercial warranty practices. Different warranties for the same product and for each customer are costly for the seller to administer (Rhoads 278). It should also be noted that, "only the Government obtains a lifetime warranty for defects that are latent or due to fraud or gross mistakes amounting to fraud" (18:2). The Inspection of Supplies (Fixed Price Contracts), Inspection of Supplies (Cost Reimbursement Contracts), and Major Weapon Systems; Contractor Guarantees clauses place these lifetime warranty requirements on the contractor (18:2).

Data Rights. The risks to contractors and their fears of losing proprietary and competition sensitive data were previously discussed. The clauses and procurement regulations addressing data rights provide very broad rights to the Government. The issue of who pays for the development of technology is only one part of the equation. The government may demand unlimited rights "when the technology, regardless of the funding source, was specified by, accomplished during, or required for the performance of the Government contract or subcontract" (46:59). The requirements placed on contractors to demonstrate complete ownership and retain data rights can be onerous.

A commercial contractor invests significant resources in developing competitive commercial processes and products. The competitive advantage resulting from the "uniqueness" of such process and products is essential to the contractor's success in its commercial markets.

To require contractors to relinquish rights in their proprietary information and/or computer software, either as an express condition of competing or as an inevitable result of being the successful bidder in order to satisfy second source competition requirements, fails to recognize and compensate the contractor for the investment.

In order to have any chance to protect commercially valuable proprietary data and computer software, current government procurement regulations would require the commercial contractor to keep records to prove private expense development of the commercial product. This approach is unfair and unworkable because it requires a commercial contractor to incur the expense of generation and storage of voluminous records, possibly for many years before the Government has any interest in the commercial product. Thus, a commercial contractor who incurs the added costs associated with generating and storing such development records will find itself at a competitive disadvantage in the commercial marketplace with respect to a competitor who refuses to do business with the Government and, accordingly, never incurs such costs.

Clauses which illustrate those problems include: FAR 52.203-6, Restrictions on Subcontractor Sales to the Government; DFARS 252.227-7013, Rights in Technical Data and Computer Software. (18:6)

Data rights are stringently maintained by the manufacturer in commercial ventures.

The buyer has access to only that information needed to operate and maintain the product for its intended use.

In the commercial sector the normal practice is for the supplier to retain all rights to the technical data associated with the product. The commercial buyer is only authorized to use the product for its stated purpose and is not provided proprietary data that would enable the buyer to become a competitive producer ... What's important to note with this practice is that commercial buyers and users of large systems, such as worldwide airplane fleets seem to be able to operate with significantly fewer data deliverables than the Government. (38:270)

Flow Down Requirements. Laws or regulations may require certain terms and conditions, such as inspection and acceptance, and required sources, be passed by the prime contractor to his subcontractors and suppliers. To ensure compliance with the contract, the prime contractor may also need to flow down other terms and

conditions. Regardless of the reason, the problems with certain terms and conditions continue and may be even more problematic for the subcontractor or supplier.

Compliance in many cases, i.e., where sourcing decisions have already been made, may be virtually impossible. Even when compliance may be possible, it may not be practical because of the administrative burden placed on the contractor and its vendors. The increased product and administrative costs have the potential to jeopardize the firms' commercial competitiveness. (38:274; 18:3)

Opportunities Currently Available for Circumventing Barriers. Barriers that are statute driven may require congressional intervention to be removed. Those that are not statute driven may be addressed through changes to regulations and policies, but there are some options immediately available to address the barriers. The FAR provides certain opportunities for incorporating commercial type acquisition strategies; however, the adoption of these practices has been limited because their use is the exception and often requires high levels of approval. DFARS 211 also provides for greater use of commercial practices in some cases.

FAR Opportunities. Subpart 1.4 of the FAR provides for deviations from the FAR. It states that the need for deviation authority should not deter agencies in developing and testing new techniques and acquisition methods. Proper contract formation in the emerging industry of commercial launch services is keyed to the innovative talent of the Contracting Officer in developing appropriate special provisions, selecting pertinent general provisions, and the willingness of his agency to use the deviation provision of the FAR (15:449-450). The FAR also takes certain steps to recognize the relevance of commercial pricing and provides the contracting officer the latitude to exempt the contractor from submission of certified data and the burdens of CAS.

The opportunities in the FAR for recognizing the effects of such market forces in arriving at price reasonableness can be exercised relative to exemption from the conventional requirement for certified cost or pricing data. FAR 15.804-3(g) presents such an opportunity, wherein an individual (or class) exemption from certified data may be made for reasons of market-driven pricing. This provision gives wide latitude to the Contracting Officer for 'exceptional cases.'

An additional opportunity to recognize market-driven pricing effects on a related, but separate, financial requirement may be found at FAR 30.201-1(b)(15). This is an exemption from Cost Accounting Standards (CAS) which results directly when the previously discussed exemption from certified cost or pricing data is exercised. (15:449)

DFARS Opportunities. DFARS 211, effective March 1992, was written specifically to incorporate purchase of commercial items employing more commercial style acquisition practices. It establishes a new set of procedures and new contract clauses for the procurement of commercial items. Although it is a significant step toward simplification of the process, there are several limitations which do not address fundamental policies that make it difficult for commercial vendors to sell to the Government. Highlights of the opportunities and limitations of DFARS 211 are outlined below.

Firm fixed price and fixed price with economic price adjustment are the only types of contracts permitted under DFARS 211. Obtaining certified cost and pricing data is prohibited under DFARS 211.7001, except for data pertaining to modifications valued at over \$500,000 for commercial products. Changes can only be ordered in method of shipment, packaging and packing, or place of delivery. All other changes must be accomplished bilaterally. Specifications are limited to form, fit, and function similar to commercial item descriptions. Quality assurance, as a matter of policy, is supposed to rely on the contractor's quality assurance program and prohibits inspection of items prior to their being tendered for inspection. However, the Inspection and Acceptance - Commercial Items clause requires the contractor's quality assurance system to be sufficient for contract items to meet specifications, and allows inspection provisions to be tailored if

the items have "critical applications." Commercial warranties are preferred under DFARS 211; however, the contracting officer has broad discretion in obtaining additional warranties. government access to data rights are substantially reduced for commercial items; however, there is still an assertion of unlimited rights in modifications accomplished under a government contract (33:132-137). DFARS 252.211-7021, while a valiant attempt to reduce flow down requirements, requires "14 clauses to be flowed down to both subcontractors and suppliers, 9 additional clauses which must be flowed down to subcontractors, and 6 additional clauses which must be flowed down to first tier subcontractors" (33:137).

DFARS 211 also has certain limitations in large dollar, long lead-time buys, such as aircraft procurement. DFARS 211 states that contractor financing will be used exclusively and makes no provisions for progress payments in any form. This has been found to be onerous in implementing commercial acquisition practices in the similar acquisition of space launch services.

For large and lengthy procurements, such as launch services, the Government recognizes in policy and regulation a need for financing to counter what would otherwise be an untenable burden on industry capital and credit markets. This is often accomplished through progress payments based on costs incurred during performance. For a service industry not attuned to job cost accounting, such as launch services, a method of progress payments based on a percentage or stage of completion is more appropriate. This type of progress payment, sometimes known as 'milestone payments,' is provided under FAR 32.102(e). It is the method which most closely resembles the 'installment' payment methodology adopted in the private sector for launch services. (15:449)

Summary

Efforts to improve government acquisition through adoption of commercial style acquisition practices have been a long sought goal. Numerous studies acknowledge the benefits of adopting commercial style practices. Unfortunately, the progress toward implementing commercial practices has been limited.

The literature reviewed indicates that the aircraft industry is a small, but highly competitive industry, ready and willing to assist in a move to commercial practices. There are numerous barriers to entering into contracts with the Government. The basis for these barriers can be found in laws, regulations, directives, and policies which combine to make the Government a less than desirable customer.

While the FAR permits some discretion and latitude in addressing these barriers, and DFARS 211 takes positive steps to enable the use of commercial practices, there are a number of concerns which have not been addressed. Large dollar value, lengthy acquisitions, such as those for commercially available transport aircraft, are not considered under DFARS 211. Current acquisition practices are entrenched in laws, regulations, and policy statements. Contracting officers must be willing and agencies must be receptive to making the changes that make good business sense in addition to good policy or regulatory sense. Legislative action is recognized throughout the literature as a key element required for substantive cultural change.

There is a need for legislative relief and clarification to institutionalize commercial practices; however, there is also a need to prove the value and viability of commercial practices and the need to identify specific areas within specific industries for such relief and clarification. The literature indicates a need to define commercial practices. It further indicates that there are some commercial practices that cannot and should not be adopted because of the Government's position as sovereign and trustee of public funds.

The next section discusses the methodology used to collect and interpret data on commercial practices in the aircraft industry, the presence of barriers in the aircraft industry, and the visions and solutions offered by aircraft manufacturers.

III. Methodology

Introduction

This section discusses the process used to collect current data addressing the investigative and research questions outlined in Chapter I. It provides the reader with the rationale for the selection of the research medium; the method of sample selection; a review of the development of the research instrument; and the basis for data analysis.

Research Design

Based on the information developed in the Literature Review, Chapter II, the small size of the population of interest--domestic aircraft manufacturers, and the investigative nature of the research, which required probing for information and expansion of responses, it was determined that the most appropriate method for data collection was the telephone interview. Telephone interviews permitted economical access to the geographically dispersed aircraft manufacturers, while retaining many of the strengths of the personal interview and overcoming many weaknesses of written surveys.

In Mail and Telephone Surveys: The Total Design Method, Don Dillman discusses 24 factors that impacted the choice of data collection method (11:39-76). Those that are significant to this research effort are discussed. Both telephone and personal interviews have good capabilities to reach a sample representative of the population. They provide known opportunities for reaching all members of the population, and high response rates. Telephone interviews have a better opportunity to reach and complete the interview with the selected respondent. In general, a telephone interview cannot be as long and the questions cannot be as complex as in a personal interview; however, both methods allow for open-ended questions and are successful in avoiding missing, incomplete, or nonresponsive answers. Social desirability bias and interviewer distortion is less likely to be introduced into a telephone interview than a personal interview;

however, there is more risk of bias than in a mail survey. Contamination of the data by others is less likely in a telephone interview, but the interviewee is less likely to seek the expertise of others when discussing areas in which he is not well-versed. Administratively, the per interview cost of telephone interviews has greater potential to be lower and tends to be less cost sensitive to geographic dispersion than for personal interviews (11:41-75).

Telephone interviews offer other advantages over a mail survey.

A major example of such advantages is the likelihood of getting far better responses to open-ended questions in telephone interviews. With skillful probing by interviewers, high quality responses to such questions are probable, overcoming one of the most nagging limitations of mail questionnaires. Another advantage is the ability to exercise complete control over the order in which questions are asked. This prevents the respondent from scanning the entire questionnaire before settling down to read and thereby being predispositioned to answer certain questions in ways they would otherwise not....The interviewer's presence also helps prevent difficult questions from being skipped and others from being inadvertently missed. Still another advantage of telephone interviews is the ease with which large numbers of screened questions, that is, questions that apply to some respondents but not others, may be handled. The complicated directions required for skipping sections of mail questionnaires and the intimidating bulky appearance often necessitated by such sections are features of which the telephone respondent need not be aware. (11:205)

Sample Selection

The interview sample was chosen using non-scientific means. All U.S. based aircraft manufacturers of commercial transport aircraft listed in the *World Aviation Directory*, see Table 1 Chapter II, were invited to participate. Those manufacturers of commercially available aircraft were contacted and asked for names of potential interviewees via the letter in Appendix A. Where the company had both commercial and government divisions, representation from both divisions was requested. The sponsoring organization for this research also provided points of contact within the companies with which they have done business. The individuals identified were invited to participate in the research via the letter in Appendix B.

Instrument Development

The schedule of interview questions was developed based on the literature review and expansion of the investigative questions. The Total Design Method (TDM) for telephone surveys, developed by Don Dillman, was employed for construction and application of the instrument. This method has helped researchers achieve excellent results.

The average results for 31 surveys is 91 percent, a full 17 percentage points higher than the average for the mail surveys. The difference persists for both the specialized and general public populations: 96 percent (versus 77 percent for the mail) and 87 percent (versus 70 percent for the mail), respectively. (11:28-29)

A recent AFIT thesis which used a telephone interview sample of 34 Chiefs of Supply achieved a 93.75 percent response rate (43:12-13, 25). Another thesis used Dillman's TDM approach to survey a sample of 379 individuals and achieved a 100 percent response rate (21:23, 37-67).

Part of the success is due to the way the researcher generates interest in the participants about the subject being studied.

The appeal of TDM is based on convincing people first that a problem exists that is important to a group with which they identify, and second, that their help is needed to find a solution...the researcher is identified as an intermediary between the person asked to contribute to the solution of an important problem and certain steps that might help solve it. Thus the reward to respondents derives from the feeling that they have done something important to help solve a problem faced by them, their friends, or members of a group including community, state, or nation, whose activities are important to them. (11:162-163)

Interest was generated in the initial contact letter, follow-ups, and in the interview by addressing the respondents as taxpayers who would want their money spent wisely and as current or potential suppliers of aircraft to the Air Force with a vested interest in streamlining the procurement process.

The interview questions were reviewed by other researchers, faculty members, and contracting officers for completeness and appropriateness. These reviews identified a need to present the interview questions in terms appropriate for the individuals' contracting experience. Three interview questionnaires were developed to guide the interviews (Appendix D). The interview questions were provided to the individuals, who were identified in the process outlined in the sample selection, several days prior to the interview. A time was then established for the interview.

The interviews were focused in nature and followed the interview schedule. However, to fully use the advantages of the interview format, allowing the interviewee maximum latitude in response while providing the interviewer the opportunity to explore responses, the interview was semi-structured. A semi-structured interview allows a greater risk for introduction of researcher bias, but it permits the researcher to explore and clarify the responses of the interviewee (47:290).

Analysis of the Data

Due to the qualitative nature of the data obtained, no statistical tests were employed. Information received through the interview process identified barriers to doing business with the Government and identified commercial practices available for adoption by DOD. The information also validated the problems associated with implementing commercial practices in the procurement of commercially available aircraft, as identified in previous studies and reports.

Miles and Huberman provide methods to analyze the qualitative data of the survey responses. The methods employed in this research are matrix displays and content-analytic dendrogram displays (30:216-228). Each of these methods provide the researcher with a visual tool to further define the relationship between individual responses.

Matrix Development. The matrix provides a summary of responses to the interview questions. Rows represent the interviewees (grouped by company/division) and groups of columns represent each question. Individual columns were used to record natural groupings of responses. Matrix cells were filled with summaries of question responses. Matrix design is a dynamic process. This format facilitated distillation of the responses into dendrograms for additional analysis.

There are no fixed canons for constructing a matrix. Rather, matrix construction is a creative--yet systematic-- task that furthers [the researcher's] understanding of the substance and meaning of [the] database, even before [entering] information. Thus the issue is not whether one is building a "correct" matrix, but whether it is a *functional* one that will give . . . reasonable answers to the questions [asked]--or suggest promising new ways to lay out the data to get answers. (30:211)

Tables 3 through 7 (Appendix F) were generated to group responses by issue (barrier, current commercial practices, recommended solution) to facilitate analysis.

Each matrix "serves both as a stand alone source of analysis and as a building block or stepping stone for other procedures" (6:43). The groupings of data derived from the matrices were used to build dendrograms (Figures 4 through 15) suggested by Miles and Huberman (30:218-221).

Dendrogram Development. The dendrogram provides the researcher with a visual tool to analyze the relationships between responses. "In daily life, we are constantly sorting things into classes, categories, bins..." (30:218). The dendrogram further defines and groups the clusters of responses provided by the matrices. Clustering is used to group and conceptualize objects which have similar patterns or characteristics. The dendrogram is a tree-like structure, with similar elements clustered together in nearby branches. Branches are further clustered to identify common attitudes or comments with varying degrees of similarity and differences.

Figure 1 shows a sample of a dendrogram structure. Reading the dendrogram, it can be seen how the elements of *crisp* and *crunchy* are related to each other. These

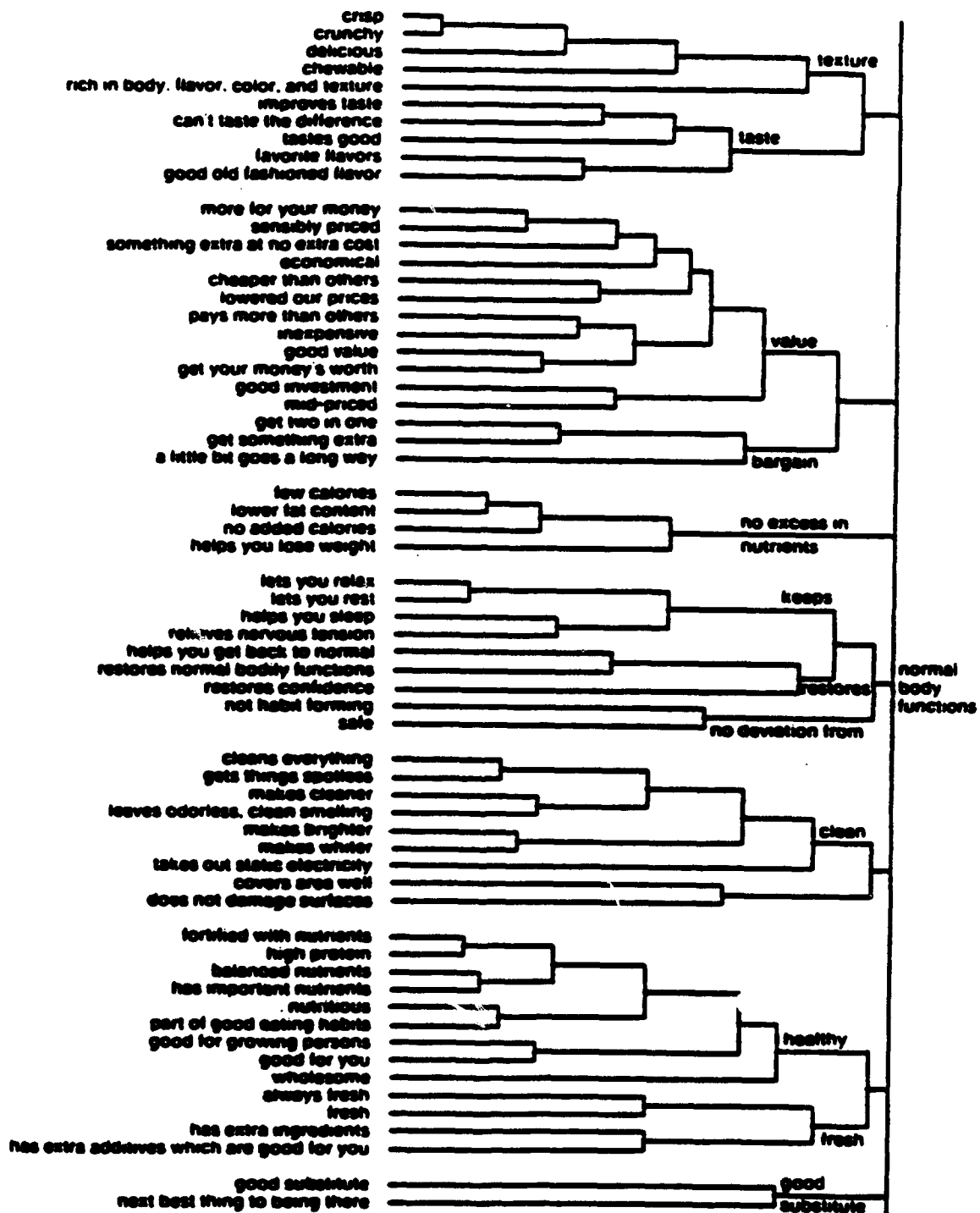


Figure 1. Sample Dendrogram (30:220)

elements are connected with a line to show their relationship. This small cluster is further clustered with the elements of *delicious, chewable, and rich in body, flavor, color, and texture* and grouped into a larger cluster identified as *texture*. The *texture* cluster is linked with *taste* and identified as an element to provide *normal body functions*, the topic of the dendrogram.

Matrices and dendrograms provide the researchers and the reader with a visual summary of survey responses. Together, these tools provide an effective means to answer the investigative questions discussed in Chapter I. The process of developing the matrices and dendrograms provided additional insight to the nature of the contractors' perceptions of barriers to adopting commercial acquisition practices in the Government. It also provided potential solutions to the problem.

Summary

This chapter discussed the data collection methods. Background information was gathered through review of current literature. Data was collected using the TDM approach developed by Dillman. The telephone interview was the method of choice due to the small population and geographic dispersion of domestic manufacturers of commercially available aircraft. The telephone interview allows open-ended questions which permit the respondents to expand on their answers and interviewers to probe for more detailed responses. Barriers to conducting business with the Government, as perceived by representatives of aircraft manufacturing firms, were determined from the interview responses.

The qualitative nature of the data prevented the use of statistical methods for data analysis. The data is analyzed using matrices and dendrograms as suggested by Miles and Huberman. Together, these tools group the data into similar categories to answer the investigative questions provided in Chapter I.

The next chapter presents the analysis of the research instrument.

IV. Analysis

This chapter provides specifics on the data collection process, and presents the data which were gathered to answer the investigative questions outlined in Chapter I. Analysis of the interview responses provides insight on how aircraft manufacturers perceive barriers to conducting business with the Government. Where appropriate, observations which can be drawn from the data are provided.

Interview Process

Interview Sample. The process of defining the sample described in Chapter III was followed. Of the thirteen manufacturers contacted, ten immediately responded to the invitation to participate in the research. One respondent, listed as a U.S. manufacturer in the *World Aviation Directory*, is a marketing office for aircraft produced overseas. They were unable to participate in an interview; however, they agreed to fill out the interview questionnaire and forward their response. At the time of this writing, their response had not been received. The remaining manufacturers responded with points of contact; each was eager to participate in the interviews. Where no initial response was received, calls were placed to determine the reason for the lack of response and, if possible, to obtain participation. Their initial lack of participation was attributable to the original dates planned for the interview, published on the invitation (Appendix 2), being too close to the actual release of the invitation. Once the miscommunication was explained, the remaining firms were quite willing to participate and provided points of contact. Only one domestic manufacturer was unable to participate due to inability to schedule an interview, resulting in a 92% response rate of the manufacturers contacted. As requested, where a manufacturer has existing government and commercial divisions, representatives were

provided from each division. Several manufacturers went beyond the initial request by providing additional individuals to interview.

Number and Nature of Interviews. Twenty interviews were scheduled, with nineteen being completed over a two-week period. One interviewee canceled his interview, due to unexpected business travel requirements. However, he stated that he would provide pertinent comments to another participant from his company who was scheduled to be interviewed later that week. Based on one cancellation in 20 interviews, the instrument and methods provided a 95% response rate. Interview times ranged from 30 minutes to one and one half hours. Most of the interviews were conducted with a single respondent, but four had additional individuals participating in the interview session. One interview was forced to be split into two sessions. One respondent provided a telefaxed copy of his responses before the interview.

Multiple Individuals. Four interviews were conducted with more than one respondent simultaneously, either by conference call or speaker phone. In two cases, the respondents provided by the company asked to combine their interviews. In the other two interviews, the respondents asked individuals with differing backgrounds or experiences to be present for the interview. For ease of interpretation, responses provided in an interview involving several individuals were treated as if only one interviewee was responding, i.e., no effort to attribute the response to one individual was attempted. The strength of support for the remark and dissenting opinions, if any, were recorded. These interviews were longer, in general, than those with an individual respondent. With several individuals participating in the interview, one response tended to spark responses from the other individuals and provided greater depth as well as breadth in coverage of the topic. Additional respondents, in these instances, did not have any observable adverse impact on the collection of responses.

Split Session. One interview required two sessions to complete due to its length and a scheduling conflict. The interview continued at the point at which it was interrupted. There were no observable adverse effects on the interview or the research results.

Telefaxed Response. One individual chose to telefax his responses to the applicable questionnaire before the interview took place. During the actual interview, the telefaxed response served as a guide to probe for additional information. It also appeared to streamline and focus the interview, permitting much greater depth in the information gathered. There were no observable adverse effects from having this information prior to the interview.

Interviewee Concerns. The two primary concerns expressed by the individuals interviewed were that proprietary or competition sensitive information, such as business strategies or pricing policies, would be included in the final product, and that their answers would be attributed directly to them and their companies. The individuals were reassured that no specific information concerning their company or their responses would be quoted directly without their consent. Interviewees were very willing to cooperate and candid in their responses to the interview questions. Only one individual appeared guarded in his responses. Another interviewee asked if the conversation was being recorded, and was assured that only written notes were taken during the interview.

The respondents candor and openness in their answers provided valuable and substantive information for the research effort. Where possible, respondents cited specific examples to ensure their point was well-made. All respondents felt the research was of a timely nature and expressed hope that it would have a positive impact.

Interview Analysis

Analysis of the data was accomplished as outlined in Chapter III. Matrices were developed to provide natural groupings of responses to categories within the investigative questions. Dendrograms were then compiled from the matrices. The results of these efforts are reported below by stating the investigative question or research goal, linking the appropriate questions, and then providing summaries of the findings from the matrixing efforts. The matrices are provided in Appendix F. The dendrogram analysis further distills the interview responses and how they relate to each other.

Demographic Data. This research effort concentrated on opinions from representatives from each of the domestic aircraft manufacturers. To provide a clearer understanding of the sample and the population of interest, the interview began with demographic questions. These questions also served as an 'ice breaker' to initiate the flow of information.

Company Demographics. The aircraft companies ranged from small to large in terms of employees and sales. The smallest company employs 250 people while the largest employs in excess of 140 thousand (Table 2). Annual sales for these companies range from \$44.8 million to \$29.3 billion (Table 2). Annual sales to government agencies range from \$447.9 thousand to \$5.6 billion (Table 2), and represent from less than 1 percent to 85 percent of their business (Figure 2). Total sales per employee range from \$83 thousand to \$278 thousand (Figure 3).

TABLE 2
Demographic Portrait
(All Sales in \$)

Company	Total Sales	Commercial Sales	Government Sales	Number of Employees	Sales per Employee
A	29300000000	23733000000	5567000000	140000	209286
B	180000000	117000000	63000000	1300	138462
C	1000000000	914000000	86000000	3600	277778
D	891000000	178200000	712800000	5000	178200
E	120700000	48280000	72420000	570	211754
F	282000000	248160000	33840000	3000	94000
G	4000000000	1200000000	2800000000	22000	181818
H	800000000	760000000	40000000	5400	148148
I	1000000000	800000000	200000000	10000	100000
J	1000000000	150000000	850000000	12000	83333
K	44785000	44337150	447850	250	79140

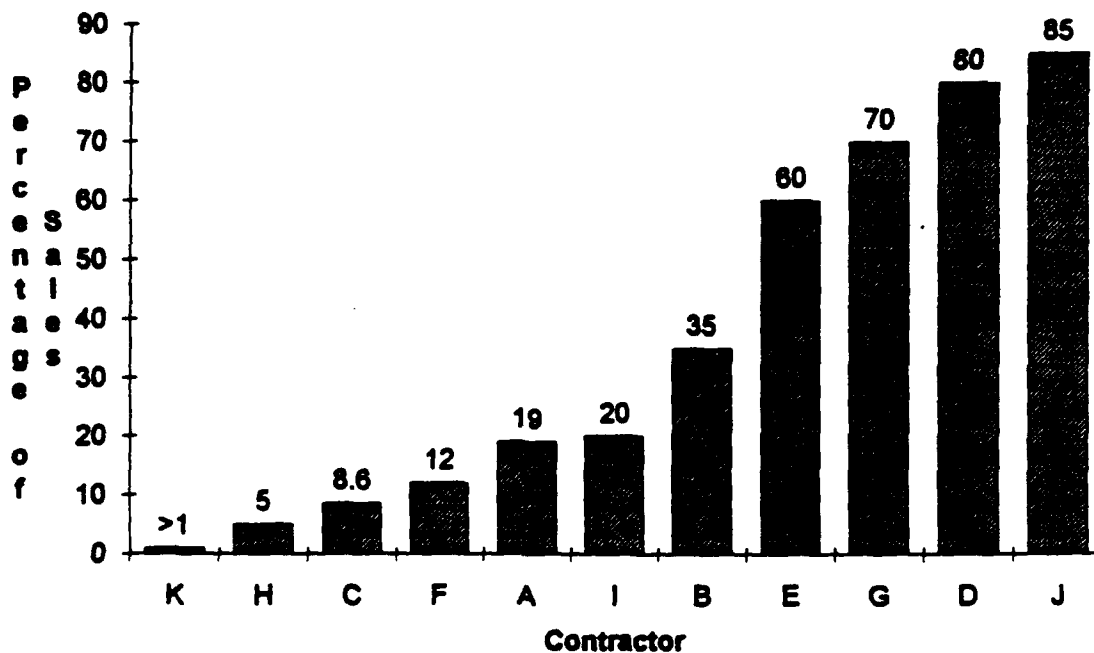


Figure 2. Percentage of Sales to US Government Agencies

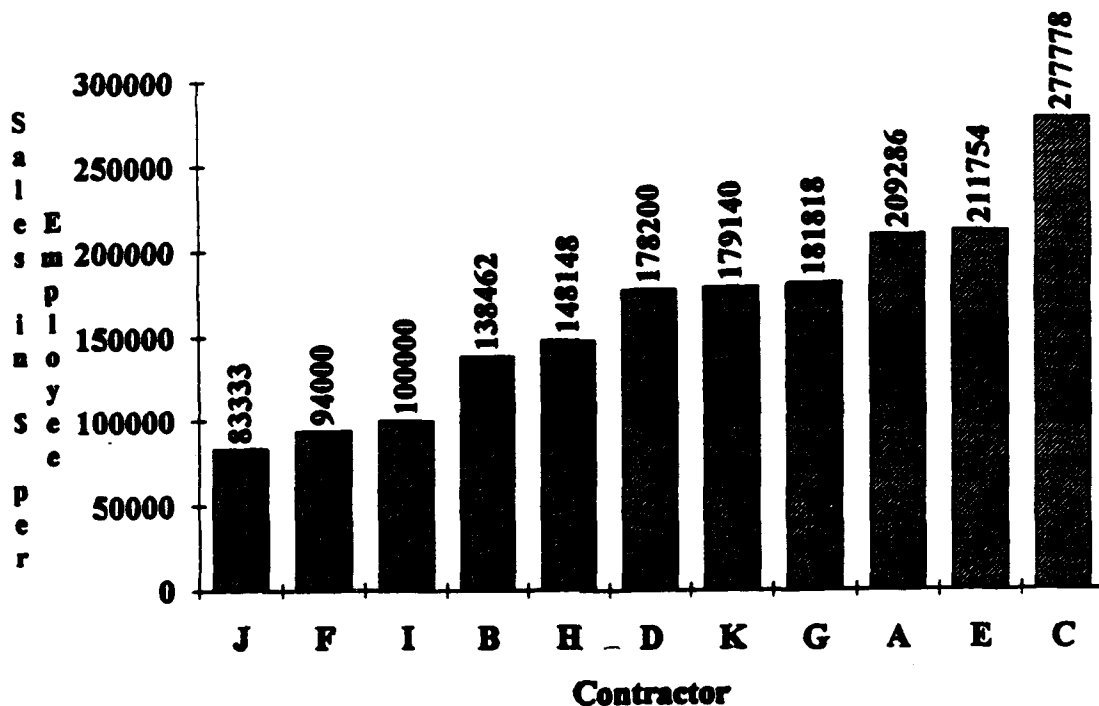


Figure 3. Sales per Employee

One company currently produces no aircraft or products, but is in the business of reconditioning used aircraft for resale and servicing existing products. Another company has no aircraft currently in production, but produces major subassemblies for other manufacturers, parts for and major reconditioning of older aircraft, and maintenance services. The primary business of the other companies is manufacturing of aircraft and/or parts.

Interviewee Demographics. The data gathered represents 546.5 years of experience in the aviation industry. Interviewees' experience within the aircraft industry ranged from 5 to 38.5 years. The average for the respondents was 27.33 years. Interviews were conducted with chief executive officers, vice presidents, directors, chief counsels, program/contract managers, and marketing managers. Such diversity assured that the responses were not focused on any one area of concern, or focused at any particular level of responsibility. Although not a studied element, some of the respondents

were involved with acquisitions while serving in the United States military. There was no discernible difference in responses from these individuals.

Interview Questionnaires. Three questionnaires (Appendix D) were developed to guide the interviews. The selection of questionnaire was based on the respondents personal experience. Individuals with strictly commercial experience were interviewed using questionnaire one. Individuals with strictly government contracting experience were interviewed using questionnaire two. Questionnaire three guided interviews with individuals who had experience in both commercial and government contracts. Questionnaire one was used once, two was used for five interviews, and the remaining thirteen interviews were guided by questionnaire three.

The three questionnaires parallel each other to the maximum extent possible. Questionnaire one asks, 'What are commercial contracting practices, and what are your perceptions of doing business with the Government?' Questionnaire two asks, 'What are government contracting practices, what problems have you encountered, and what commercial contracting practices are you aware of?' Questionnaire three asks, 'What are commercial practices, what are government practices, and what problems have you encountered?' All questionnaires ask for suggestions to improve the government's acquisition system. Appendix E shows the investigative question or research objective for which each question was designed to provide information.

Matrix and Initial Analysis

Investigative Question One. What are commercial practices in the commercial aircraft industry.

Five areas of interest were addressed for Investigative Question One: contract length; number of clauses; significant clauses (contractor and commercial customer); product descriptions; and payment practices. Due to the differences in commercial

terminology, i.e., terms and conditions, articles, and the contractors' reliance on the UCC, data received from this question did not permit analysis. All other questions provided information to the analysis effort.

Typical commercial contracts ranged in length from two (a simple sales agreement) to 300 (a complex multi-year procurement) pages. More than half of the contractors regularly use a contract with less than ten pages. Only two reported writing commercial contracts with more than 50 pages and these were for long term complex procurements. In some cases, engineering design specifications are incorporated into the contract, and are reported to add 75 to 100 pages.

Significant terms and conditions for the contractors were price, delivery schedule, payment, and warranty terms. The interests of the commercial customer were similar in wanting a particular product, at a specific price, for delivery on a certain date, and expecting certain performance from the product.

In commercial purchases of aircraft, the description usually consists of a standard product description, functional or operating specifications, FAA certification requirements, and a description of options, special equipment, or configuration requirements, i.e., ambulance, passenger, executive transport.

Payment schedules for commercial aircraft usually require ten percent of the purchase price as a down payment, with one or more progress payments. These payments are due either a certain number of months prior to delivery or upon completion of certain milestones, i.e., when the engines, wings, or avionics are installed. The balance is due upon delivery.

Investigative Question Two. What are the government practices in acquiring commercial aircraft?

The five areas of interest addressed in Investigative Question One were addressed in Investigative Question Two: contract length; number of clauses; significant clauses

(contractor and government); product description; and payment practices. In addition, the uniformity of contracts and clause application, and the effect of personnel transfers were discussed. As in Investigative Question One, the question on the number of clauses did not provide analyzable data to the study. This was attributed to the variability in application of government clauses.

Some respondents stated that there were no "typical" government contracts and consequently they did not feel able to respond to the question on the length of a typical contract. Those respondents who quantified their response indicated that their contracts ranged from 100 to over 1000 pages. Once changes are incorporated, and if the specifications are included in the page count, the total can easily reach "thousands". One contractor noted that the numbers are actually artificially low because of the number of clauses incorporated by reference. He went on to state that if the contract were to include the full text of all of those clauses, each of the contracts he has worked on would be "thousands of pages long." Another contractor suggested that the appropriate measure should be in inches rather than pages.

According to the contractors interviewed, the significant clauses (terms and conditions) to the Government were very diverse. Each agency and contracting officer appears to have its own emphasis. Paralleling this, the contractors provided very diverse inputs in what was significant to them in doing business with the Government. Each emphasized payments and delivery schedule, but beyond this, their responses reflected the interests of the agency with which they were dealing.

Nearly all government contracts include detailed specifications and MILSPECs to describe their requirements. Three contractors refuse to participate in contracts that include requirements beyond their standard product and technical specifications. One will only accept detailed specifications on items that are not FAA certified, if the specification is in a format they normally work in, and only if it does not reference other specifications.

Payments under government contracts range from payment on delivery to standard progress payments which reimburse the contractor at 80 percent of the contractor's cost. To receive standard progress payments, the contractor must be CAS compliant. As identified in Chapter II, one contractor who is not CAS compliant was able to get commercial style payments established based on milestones of verifiable activities; however, the approval process took more than nine months. This is not identified in the matrices or the dendrograms because of the promise of anonymity to respondents. Contractors are paid 30 days after receipt of a proper invoice, or inspection and acceptance of the product or service, whichever is later.

There was a general agreement in responses that government contracts are fairly uniform within each agency. Although there are similarities from agency to agency because of the mandatory requirements of the FAR, there are significant differences in the agency supplements and mandatory requirements placed on top of the basic guidance. Most variance in clause application comes from interpretation and that is somewhat uniform within each agency. Individual personalities, egos, or philosophies were seen to drive the lack of uniformity. One representative felt that it was too standardized and did not permit recognition of the real requirements.

Investigative Question Three. How do commercial practices differ from government acquisition practices?

Eight areas of interest were addressed in Investigative Question Three: segregation of government and commercial business; contract length; number of clauses; significant clauses; product description; payment structure; contract uniformity and clause application; and the impact of personnel transfers. As previously noted, the questions on number of clauses did not provide analyzable data for this project.

All contractors, except for one that sells strictly COTS parts, find it necessary to separate their government and commercial business in some manner. The methods range

from separate sales and management offices to completely separate production facilities. The reasons for the separation are: to assure that no government costs were introduced into the commercial products; to keep the company out of trouble and comply with all the numerous requirements; and to maintain clearly defined data rights. The most common reason given for needing to separate the business was to comply with the cost accounting standards and reporting requirements in doing business with the Government.

The differences in length of the contracts is a significant indicator of the differences in doing business with the Government and commercial firms. Government contracts are, at a minimum, double the length of commercial contracts. When the Government is purchasing a commercial transport aircraft, the contractor must ask what is being required beyond what is required in his commercial contract.

Significant terms and conditions in commercial contracts are straightforward: the contractor wishes to sell a product and the customer wishes to purchase the product. The key terms to both are price, delivery schedule, payment schedules, and warranty provisions. All terms and conditions are subject to negotiation. In government contracts, there are numerous requirements in addition to providing a product. Most of these are non-negotiable, consequently the interests of the Government must become key interests of the contractor. These items of interest vary from agency to agency and contracting officer to contracting officer. The other change in emphasis that takes place is that in commercial contracts, the customer relies on the expertise of the contractor. In government contracts, the buyer goes beyond telling the contractor what is required by telling the contractor how to build the product, who to hire, where to get supplies, and how to contract for supplies and subcontracts.

Description of products is much more detailed and regulated in government acquisitions. MILSPECs are a particular problem because of their lack of currency, the

lack of knowledge of those that employ them, and the spider-webbing created by one specification referencing others which, in turn, reference other specifications.

For those contractors with a CAS compliant system in place, and where standard progress payments are authorized, the primary concerns are the amount of paperwork involved in receiving payments and the lack of adequate customer service to the contractor when processing payments. Several comments were received that said the requirement to use a DD form 250 created significant duplication of effort and additional work since it does not correspond to their standard invoicing system.

For the contractors not covered by CAS, the cost of carrying the Government through the acquisition is significant and is not present in doing business with a commercial customer. Several contractors commented on the practice of not releasing a check until 30 days after invoice or acceptance. In commercial deliveries of aircraft, it is customary to require payment on the day of final delivery. In commercial leases, the practice is to pay for the use of the item prior to its use, i.e., to pay for the aircraft on the first day of the month. In leases to the Government, the contractor cannot invoice until the end of the month and then is required to wait at least 60 days from the date it would customarily be paid.

In commercial contracts, the contractor generally follows a standard contract that it wrote. The contract is negotiable, attachments and options vary, but the basic contract remains. In government contracting, the contractor can expect the mandatory FAR provisions, but beyond this, clause application and interpretation varies by agency and contracting officer.

The impact of personnel transfers was studied only from the perspective of effects on government contracts. Correlation of government practices with commercial practices is, for the most part, unavailable. However, the data collected from this interview question does provide insight into the relationship between the contractor and the

Government and the impact of personnel transfers on government contracts. The comments ranged from indicating that transfers had no effect or the effect was negligible since the individuals have so little authority, to personnel transfers being a significant problem. One contractor was not impacted because of selling only COTS items on purchase orders. Two contractors found that personnel transfers had no effect or an insignificant effect. The remaining contractors identified the lack of continuity, the need to bring the contracting officer "up to speed", the need to reestablish trust, and the disruption of having to "reinvent the wheel" with each transfer as significant problems. One representative stated that the civilian sector was much more stable.

Investigative Question Four. What do contractors perceive as barriers to doing business with government agencies?

This investigative question was addressed through questions on the problems contractors experience in doing business with the Government; significant and onerous clauses; product descriptions and problems with government specifications; payment structure and problems with payment practices; problems with CAS; the uniformity of contracts; the impact of personnel transfers; and why the contractor may have elected not to pursue a government contract.

The question, "What problems have you experienced in doing business with the Government?", was an overview question and the responses covered the entire acquisition process. Common denominators throughout the responses included: overgrown, intrusive oversight; excessive specifications and standards beyond FAA requirements; the Government's preoccupation with cost rather than price; bureaucracy; and excessive reporting requirements and paperwork.

Common onerous clauses included any clause that involves cost and cost accounting requirements; clauses that require certifications which carry criminal penalties;

clauses which create intrusive oversight; and clause that tells the contractor how to fulfill requirements; who can be hired; who can be subcontractors; and where to obtain supplies.

Government specifications were found to be poorly written; outdated; improperly used; too numerous to be manageable; often unrealistic for the performance environment; and often open to interpretation. MILSPECs were also found to be difficult to work with because they often reference other specifications which, in turn, reference still other specifications. The specifications are also often redundant or contradictory to other requirements the contractor must meet, such as FAA certifications.

For contractors with CAS in place, payments created few barriers. CAS does create increased costs that must be passed on to the Government, the Government pays on a net 30 day basis, and the DD 250 does create extra work for the contractor because it is incompatible with commercial invoicing systems. Additional audits, paperwork, and time consuming administration were cited as problems experienced with government payments. Contractors without CAS in place must build the cost of financing the government project into their proposal or seek special commercial payments, which is a long and difficult process.

CAS is expensive to implement and administer. It is incompatible with Generally Accepted Accounting Principles (GAAP) and the rulings of the Financial Accounting Standards Board (FASB), which the contractors comply with for commercial and tax purposes. CAS was described as outdated and as a crutch the Government instituted to help poorly trained, inexperienced auditors. It was seen as having no place in the commercial environment and having no purpose in a commercial acquisition, since prices are market based, not cost based.

The uniformity, or lack of uniformity, present in contracts makes each contract with the Government a new experience. Contractors cited several cases where they have found totally incompatible requirements residing in the contract. Boilerplated solicitations

and contracts, as well as clauses incorporated by reference, were identified by the respondents as common sources of the problems. In many cases, they found that the purchasing organization did not realize what it had requested. One such contract asked for a building to be constructed as part of the contract. The contractor was willing to do the work, if the Government would explain how to flight test it. As one contractor explained it, "each contract is a potential mine field."

Personnel transfers do have an impact on the contract and the contractor. The responses indicate that this is a more significant problem in government contracts than in commercial contracts. One problem is in creating a working relationship and trust with each new individual. Another problem is in the new individual learning the contract and in the contractor learning how each individual will interpret the contractual requirements. The third problem is the loss of continuity and corporate memory that occurs in each change. Two contractors described their feelings as, "Another damn contracting officer to train." The contractors also described one impact of the frequent moves as creating a "lame duck syndrome" and a "lack of ownership". Contracting officers often lack the authority to make decisions. By the time the decision reaches the appropriate approval authority, the author of the request is not the one that must seek its approval. Contracting officers are also seen as sometimes being unwilling to push for changes because they will be moving on and it will not affect their position.

Investigative Question Five. Based on the contractors' responses, which commercial practices should the Government adopt? (What are the benefits of adopting commercial practice to the contractor and to the Government?)

The questions used to address this research question included: what changes are required in contract clauses and what commercial clauses would be more appropriate; how should government contracts describe the product required; what should payment practices be; what recommendations do you have on CAS; what evidence of acquisition

reform have you seen; and if you were in charge of government acquisition, what would be the top three changes you would make.

The primary suggestions for changes in clauses involve removal of references to cost when acquiring a commercial product; requiring the contracting officer to review each clause prior to its inclusion and giving him authority to remove those not appropriate for the acquisition; and a move to greater use of commercial standards and inspection methods for commercial products. Contractors feel that in acquiring a commercial product that is subject to commercial market requirements, the Government should move to a greater reliance on the UCC and commercial practices. Where an item is already regulated by one agency, there should be no need for duplication of those efforts. Two respondents felt that the system is beyond repair and that a totally separate regulation needs to be in place with people trained to do commercial acquisitions using totally commercial methods.

Product descriptions should be based on performance and functional specifications. The only use of government specifications and detailed specifications should be in those areas not normally considered as part of the commercial product. Given this, the additional detail should only be used if a commercial specification is not available. In acquisition of commercial products, Mil specs and other government specifications should require a complete review and justification, including a cost/benefit analysis, prior to inclusion in a contract.

Use of commercial style payments was almost universally recommended. Most recommended milestone payments key to specific verifiable performance and model them after the terms used in the manufacturer's commercial operations. Other suggestions include allowing the use of commercial invoices; becoming more business like (more customer service oriented in tracking payments); and reducing the payment time to reflect the commodity being purchased, i.e., net 10 or net 15 on monthly services.

The recommendations on CAS reflected the opinion that purchase of a commercial item on a Firm Fixed Price contract should not involve cost data. CAS requirements should be removed from all commercial purchases. Where cost becomes a factor, as in the pricing of modifications when price analysis is not sufficient, GAAP and FASB standards should be adequate.

Evidence of acquisition reform to allow use of commercial practices in acquiring commercial products has been extremely limited. The contractors said that they have heard a lot of words and have seen a lot of studies, but have seen very little, if any, action. Two representatives identified small moves to accept FAA certifications, and representatives of one contractor identified its success in getting commercial style payments as the only visible progress in this effort. DFARS 211 was identified as a good effort, but as an effort that falls short. Recommendations for reform centered around developing a totally separate section of FAR or a totally separate acquisition regulation applicable to commercial products based on the UCC.

The changes that the respondents would institute if they were in charge (other than changing jobs, which four respondents wanted to do) included changes to reduce regulations; reduce the adversarial nature of the current relationship; separate military and commercial purchases; professionalize and streamline the acquisition work force; provide more authority to program managers and contracting officers; and "fire *do nothing* bureaucrats." To reduce regulations, respondents suggested removing all FAR supplements. To reduce the adversarial environment, the respondents suggested better training and a teaming approach to developing commercial practices. By separating commercial acquisitions from military specific acquisitions, a clearer definition of where FAR, MILSPEC, and CAS requirements are appropriate would exist. Authority to implement appropriate changes needs to be provided to acquisition personnel. A cultural

shift to adopt commercial practices that are currently available, and develop new approaches was also recommended.

The benefits of adopting commercial practices for the contractor includes reduced costs, increased profits from additional sales, reduced oversight, and streamlined operations. The benefits for the Government include reduced costs for products and for acquisition costs, improved quality, shorter delivery schedules, increased competition, and a streamlined acquisition system.

Dendrogram Analysis. The dendrogram structure shows how the interview responses cluster into natural groupings derived in the matrixing efforts. The resulting clusters of responses and their relation to each other, enabled the researchers to summarize and draw conclusions from responses to the questions posed. Creating the dendrograms was as insightful as the interviews themselves.

The dendrograms do not indicate the frequency of identical responses; however, similar responses serve to strengthen the correlation and conclusions. The length of the lines connecting any items have no correlation to frequency of response or relative importance. The lines merely indicate how a given response relates to other responses and to the generalizations derived from them.

Not all of the topics contained in the matrices lend themselves to dendrogram construction. The topic broadly stated as "other" allowed too many divergent ideas to be clustered in a meaningful manner. Consequently, not all column headings found in the response matrices have a corresponding dendrogram.

Contractor Interests. The dendrograms indicate that aircraft manufacturers' normal interests of product, performance, and price expand to include special government requirements.

Commercial Sales. Manufacturers are concerned primarily with their expected performance, product, and financial concerns (Figure 4). These three

categories interact with each other to affect the price of the delivered aircraft. The manufacturer concerns itself with the delivery of the aircraft. Specifically, they are interested in the delivery date and inspection and acceptance of the delivery.

The manufacturer is also concerned with the product. The product description and warranty are the driving factors of price in this area. The product description includes any standard items, options, special equipment, or other standard items. Warranty terms may vary by model and customer. Training may also be included as part of the product. Some manufacturers train one or more individuals to fly and/or maintain the aircraft.

Financial concerns include primarily price and payments. The payment terms vary by contractor. The primary purpose of the payments is to cover incurred costs and the cost of money. The manufacturer may also be concerned with a market or quantity guarantee. This guarantee allows the manufacturer to project production and inventory requirements to ensure smooth operations. Another financial concern is taxes and which party is responsible for paying them.

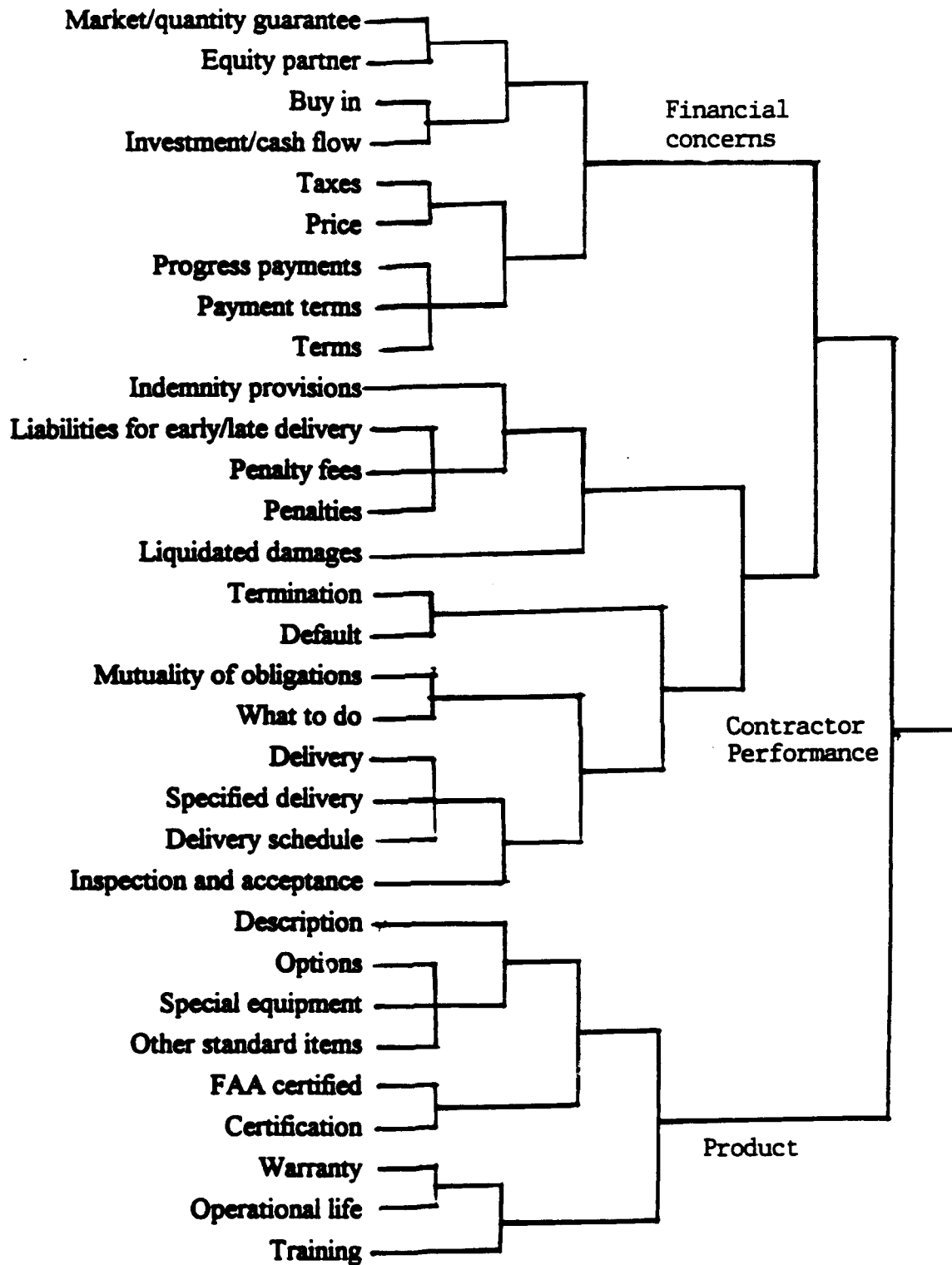


Figure 4. Contractor Interests (Commercial Sale)

Government Sales. The aircraft manufacturer has additional interests when conducting business with government agencies (Figure 5). The concerns present in commercial contracting, expected performance, product, and financial matters, are present in government contracting; however, additional government requirements must be considered. The manufacturer must consider additional reporting requirements, accounting requirements, and clauses included in the contract that are not related to the three categories of commercial concerns.

The manufacturer still concerns itself with its expected performance in fulfilling the contract. The Government reserves the right to terminate the contract at its convenience. Any damages for contract default and compensation for contract changes are also included in the contract. Other government requirements pertaining to performance include risk management and the statement of work.

The Government defines the purchased product with greater detail than a commercial customer. The expected product quality is explicitly included in the contract. The Government reserves the right to inspect the product at any stage of production presenting an additional nuisance to the contractor. Additional government or military specific items or configurations may be included in the final product.

The Government imposes additional financial requirements on the manufacturer; however, it expects to receive the same price consideration a commercial customer with a long standing relationship receives. The cost data must be tracked using a certified cost accounting system. All data pertaining to cost must be made available to government auditors.

Government agencies also require some socioeconomic clauses to be included in the contract. One clause requires the contractor to obtain supplies from a small or disadvantaged business. The aircraft industry has established suppliers and using a small or disadvantaged business in fulfilling the obligations of the contract may be impractical or

improbable. Some government required clauses, such as OSHA, are already applicable to the contractor. Their inclusion in the contract only serves to lengthen the document.

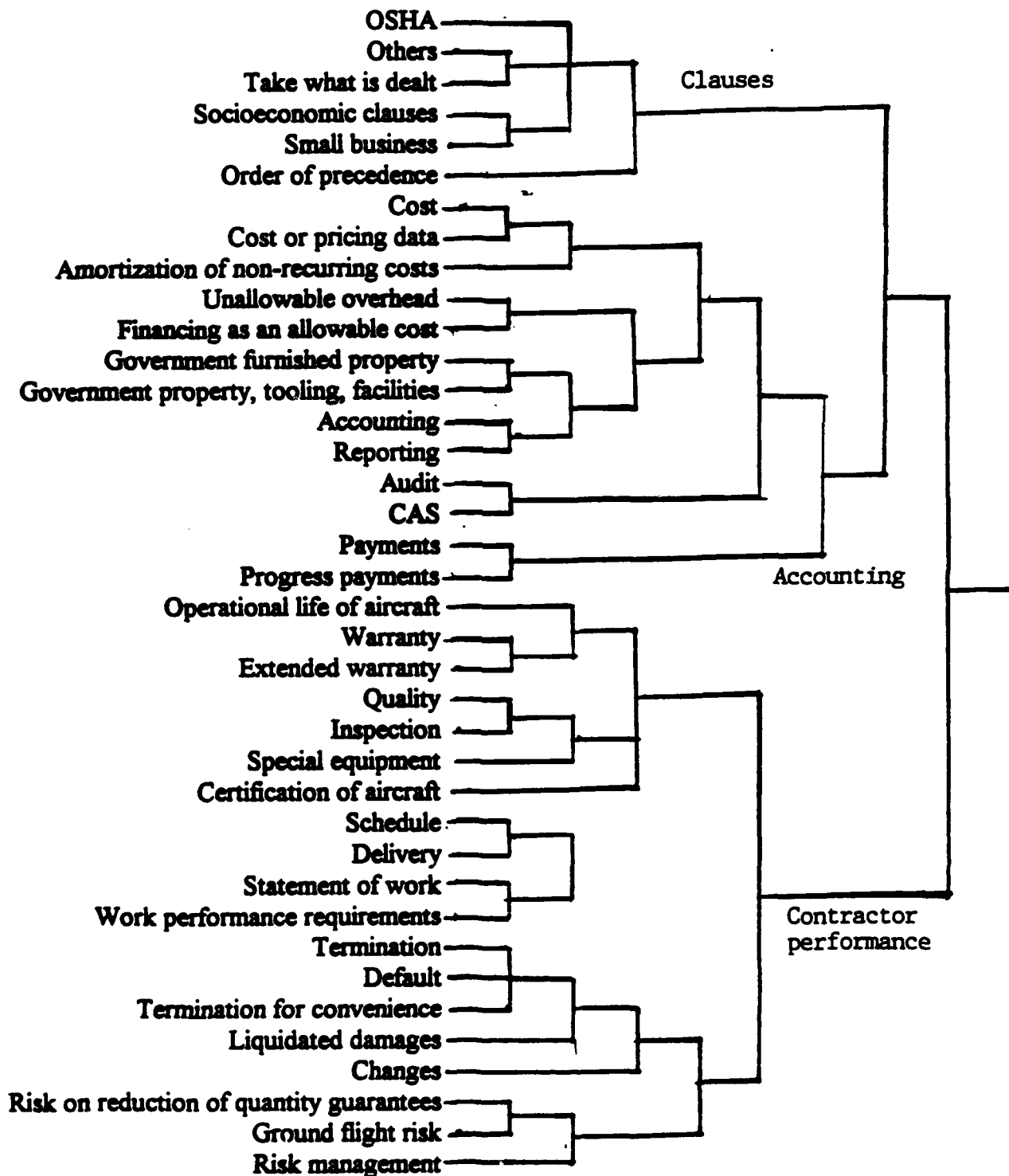


Figure 5. Contractor Interests (Government Sale)

Customer Interests. Government interests, as a customer, are much broader than the interest of the commercial customer.

Commercial Customer Interests. A commercial customer has relatively basic interests in the contract (Figure 6). It wants aircraft, at an agreed price, on the specified delivery date (barring allowable delays). The aircraft is described and the warranty is provided in the contract. The contract gives the commercial customer certain obligations and rights. The commercial customer generally uses little negotiation and rarely seeks to expand the manufacturer's standard contract; however, all terms and conditions of the commercial contract are negotiable.

The price is influenced by the payment method. As the manufacturer is required to finance production itself, the price increases. A customer who pays for the aircraft at contract execution pays less than the customer who pays at delivery. The manufacturer adds any finance charges to the cost of the aircraft. Other financial matters include liabilities for late delivery or termination on the manufacturer or customer's part.

The customer has little interest in how the manufacturer performs. It is concerned that the manufacturer fulfills the terms of the contract and delivers the product on the specified date. The contract identifies any special inspection or acceptance criteria.

The aircraft is described in terms of product, performance, and other standard items. Additional interests include quantity, warranty, and manufacturer provided training. In discussing the product, the contract includes descriptions of selected options, the warranty, and manufacturer provided training. Minimum quantities are also fixed as part of the product to be provided under the contract.

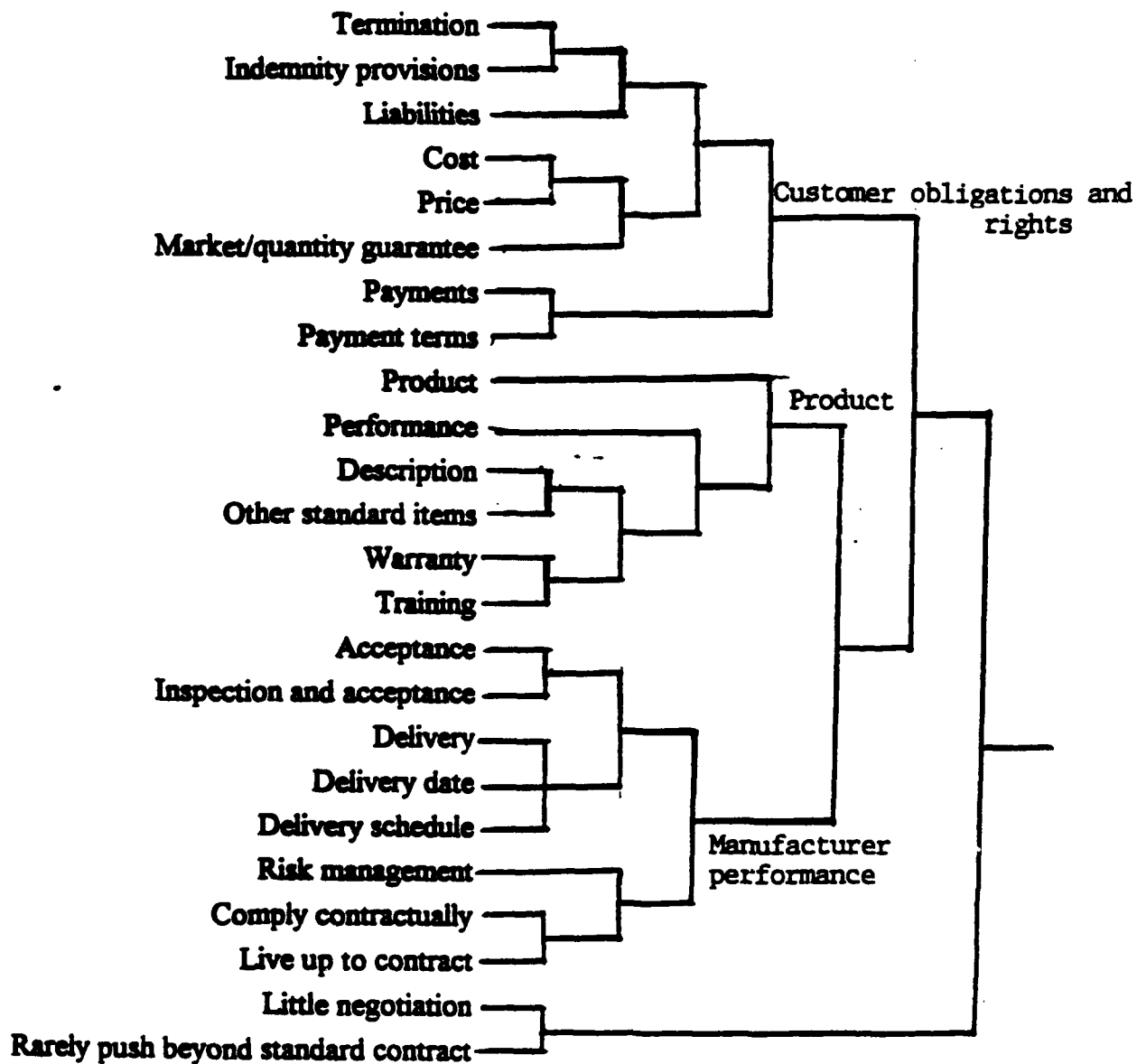


Figure 6. Commercial Customer Interests

Government Customer Interests. The Government, as a customer, requires more detail and greater involvement than a commercial customer (Figure 7). The Government is the author of the contracts it enters. The Government includes special, non-commercial requirements, in stating product and performance requests. It also includes special requirements not related to product performance.

In describing the product and stating expected contractor performance, the Government often tells contractors how to build the product and approves the production plan. Quality requirements go beyond inspection, acceptance, and inspection, and warranty provisions by establishing rigid, military quality and inspection standards which have no commercial equivalent. Latent defect requirements effectively extend the warranty to the service life of the product. Government specifications create a network of requirements that are often difficult, if not impossible, to satisfy.

Government specific requirements are levied on the contractor through numerous clauses, socioeconomic requirements, cost reporting requirements, and other requirements designed to protect it from fraud, waste, and abuse. The number of clauses, agency specific clauses, redundant clauses (such as OSHA requirements), and, as one respondent state, clauses that *nickel and dime* the contractor, create performance expectations unlike any commercial endeavor. Such requirements are incompatible in an ongoing production concern where sourcing decisions have been made well before the government contract is contemplated. Reporting requirements related to cost, requirements to release data rights, measures to increase competition, and oversight to prevent fraud, waste, and abuse, are also inconsistent with commercial practices.

Product Description. The commercial and government customers choose various methods to describe the product being purchased. The Government insists on more detail than the commercial customer.

Commercial Sales. The commercial contract generally has two requirements: product description and product performance (Figure 8). The description can be in the form of a standard product description or model specification. Options are also stated. In some cases, the standard description and selected options are combined into a word order specification. In a complex contract, detailed specifications may also be used to describe any unique or special purpose items on the aircraft.

The contract also requires certain product performance: the aircraft meets FAA certification requirements and is suitable to operate in a certain environment and operating envelope. Functional requirements may also be described through functional specifications. These functional specifications are incorporated through technical specifications developed by the manufacturer.

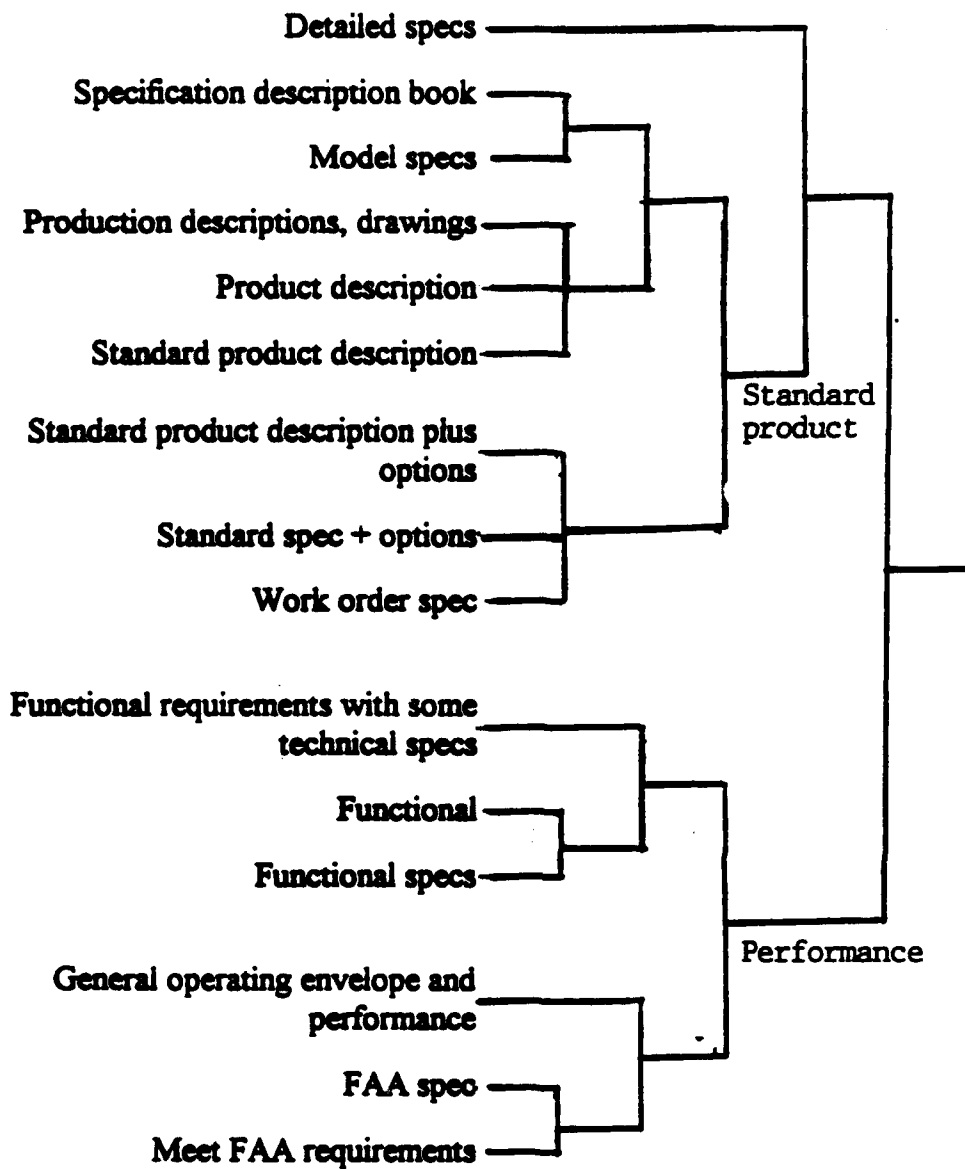


Figure 8. Commercial Product Description

Government Sales. Products are described using a combination of detail, technical, and functional specifications (Figure 9). Detailed specifications are used to level the playing field for all bidders. They are usually based on MILSPECs with some technical and functional specifications. Often based on a combination of MILSPECs, functional specifications, technical specifications, and some product descriptions tend to design a solution rather than state a requirement.

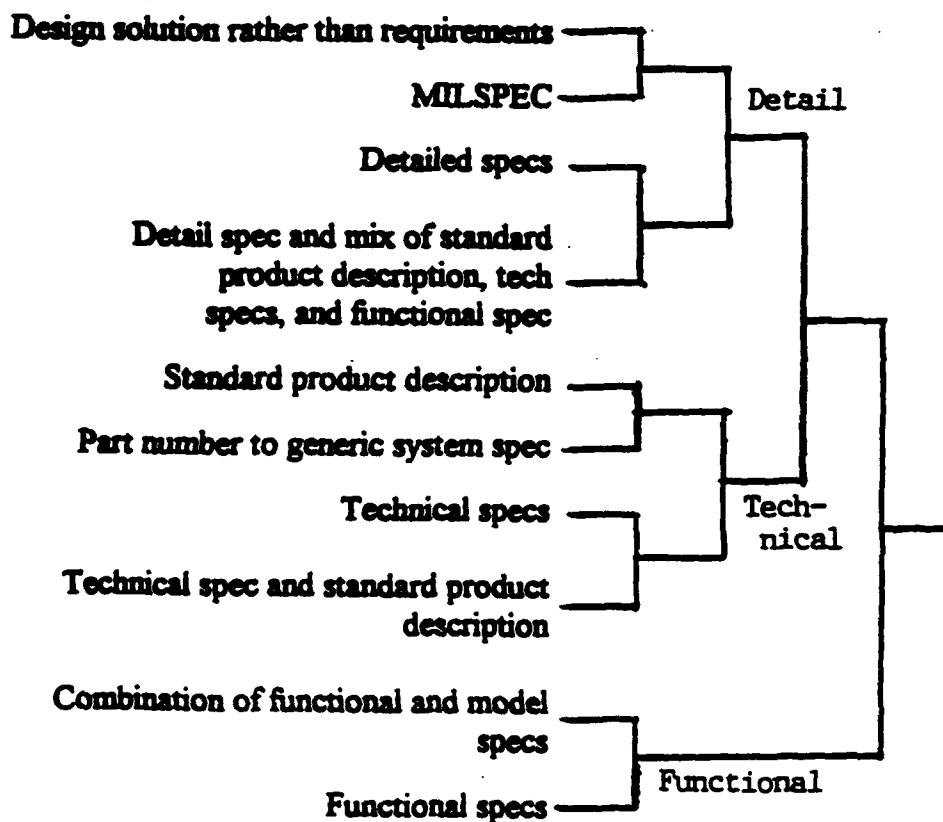


Figure 9. Government Product Description

Reasons for Market Segregation. There are three basic reasons to segregate the commercial from the government markets: accounting requirements; contract requirements; and simplicity (Figure 10).

The main accounting reason for segregation is cost integrity. The manufacturer does not want government induced costs to flow into commercial operations. For example, the cost of implementing and maintaining CAS is a government related overhead cost. These costs cannot and should not be included in establishing a commercial price. Other accounting requirements include those for government furnished property and government sponsored development. The bottom line is that the contractor needs to be able to determine if he is making or losing money.

The contractor may have a contractual obligation to segregate commercial and government business. The contractor may also segregate the markets to protect proprietary and competition sensitive data. The segregation serves to keep the contractor compliant with any law, regulation, or contract which necessitates segregation.

It may just be simpler for the contractor to segregate his business. Needs of commercial customers are simpler. Commercial customers want no part of government accounting standards and are interested in price, not cost. The nature of the commercial and government requirements and practices provide a natural separation of operations.

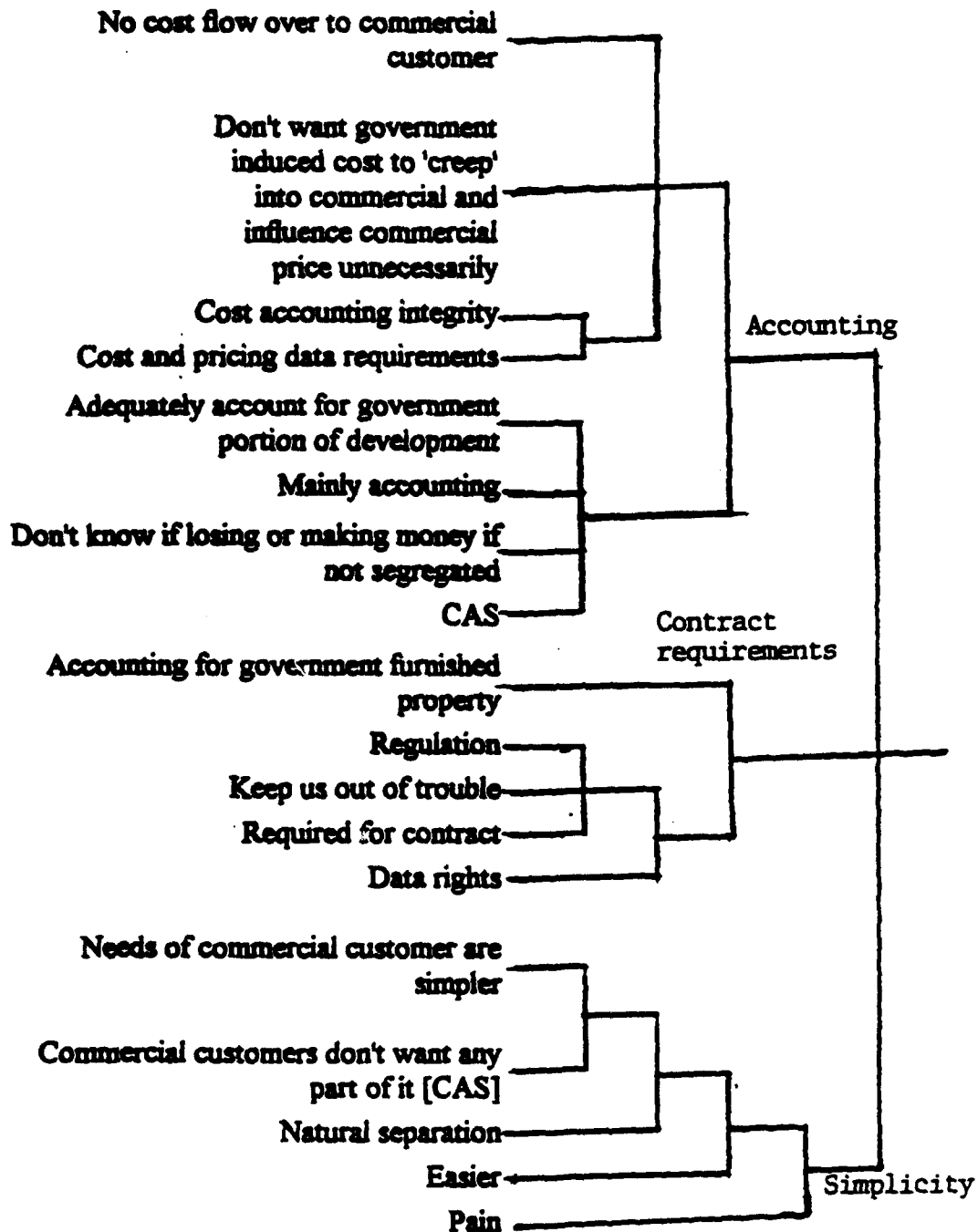


Figure 10. Reason for Market Segregation

Onerous Clauses. Onerous clauses were readily identified by the respondents during the course of the interviews. The general areas of concern include oversight, socioeconomic clauses, clauses that increase contractor risk, clauses that are intrusive to the contractor's daily operations, and the requirement to flow many of these requirements down to subcontractors (Figure 11).

Oversight includes requirements that go beyond FAA requirements, redundant requirements, certification requirements, and requirements for cost data and analysis. The position of the respondents is that, in a contract for a commercial product, these requirements are inappropriate.

Socioeconomic requirements are intended to give as many businesses as practical a share of government money. These clauses regulate who is to be used as suppliers, how to compete subcontracts, and how to conduct business with agencies and companies of foreign nations. In an ongoing business concern with established suppliers, such requirements are inappropriate.

Clauses that increase contractor risk are a fact of life for contractors; however, many of these clauses reference cost rather than price, expect long-term performance at a fixed price, and demand service life support where it may be commercially inappropriate.

Clause flow down to subcontractors and suppliers creates the same barriers for contractors as it does for the Government--subcontractors do not want to operate under the onerous clauses. The contractors do not have the weight of public law behind them. In many cases, the contractor is forced to either find other, more expensive, suppliers, or risk continuing with its present suppliers, hoping that those provisions will not be executed.

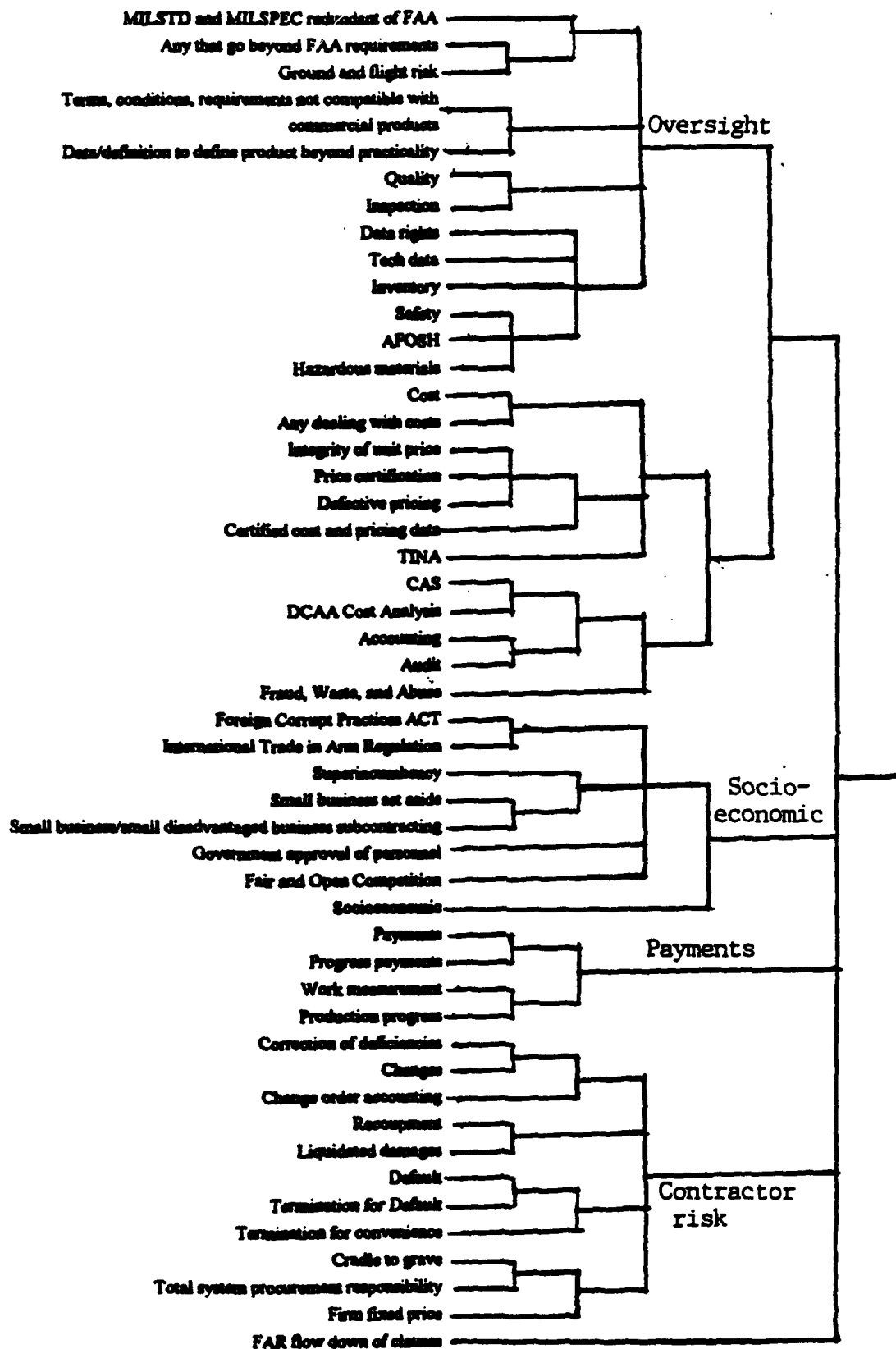


Figure 11. Onerous Clauses

Bureaucracy and Oversight. Bureaucracy and oversight present significant hardship on manufacturers. Additional inspections, audits, and layers of decision making add time and cost to contracts (Figure 12).

Bureaucracy is seen as self perpetuating. Decisions are slow and require documentation to flow through the various levels of the organization with disapproval possible by an individual at any level. These individuals are more concerned with justifying their jobs than lowering cost.

Oversight, CAS, and inspections are viewed by the contractors as second guessing their operations. Numerous agencies such as the DPRO, DLA, DCAA, the buying agency, and various IGs oversee the contractor's performance. The contractor finds that it must justify its commercial practices to these agencies. This lack of trust presents an adversarial relationship in the contract negotiations, management, and fulfillment.

CAS imposes additional costs, paid by the Government, with no additional value to the Government. CAS requires the contractor to maintain two accounting systems. CAS also requires volumes of data and paperwork to be submitted regularly so costs can be verified. One contractor stated that the Government "spends a thousand dollars to save a dime."

The Government conducts inspections in addition to those required by the FAA. The FAA certifies the airworthiness of the aircraft and many components. Additional inspections and testing in many cases serve only to increase the cost of the aircraft. Commercial customers expect the aircraft conforms to FAA standards and rely on final inspection and acceptance as well as product and performance warranties to assure themselves of a quality product.

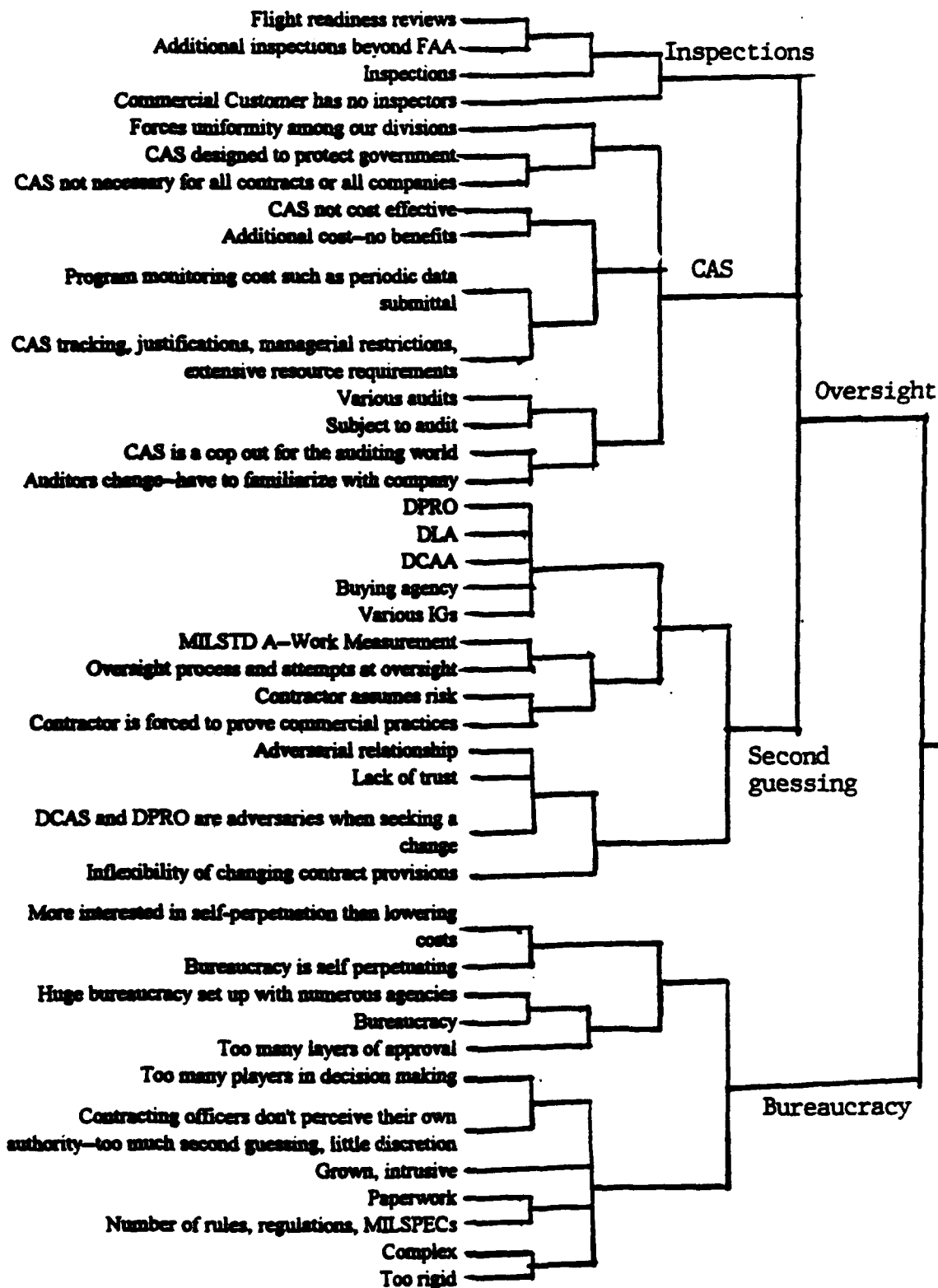


Figure 12. Bureaucracy and Oversight

Uniformity in Government Acquisitions. Uniformity can be examined in terms of contract, individuals, and agency (Figure 13). The primary belief is that the only consistent clauses included in the contract are those clauses mandated by law.

Individuals vary. Ego and personality affect interpretation of clauses. How closely the individual manages the contract also affects uniformity. It was also mentioned that there is variation among individuals involved in the same program.

There was a general consensus that contracts are fairly uniform within an agency, but varied between agencies. Each agency has its own approach and philosophy. An agency may have a particular clause or set of clauses which it insists on including in every contract.

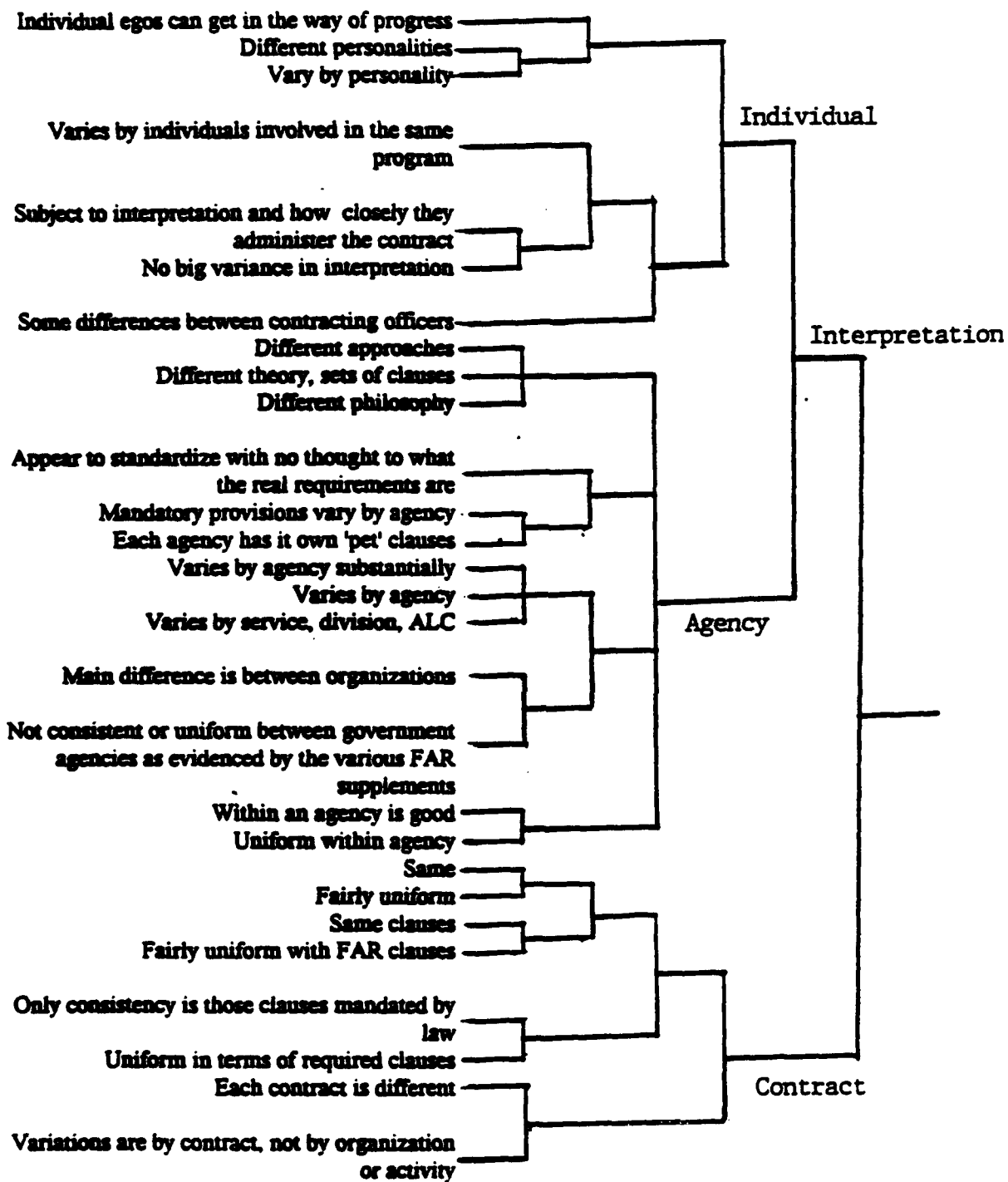


Figure 13. Uniformity In Government Acquisitions

Benefits of Adopting Commercial Practices. There are benefits to adopting commercial practices. These benefits are virtually the same between the contractor and the Government. The three main areas of mutual benefits are in terms of cost, quality, and schedule.

Contractor Benefits. The interviewed contractors see benefits in terms of reduced costs, increased profits, less oversight, better operations, and quality improvements (Figure 14). Costs are reduced primarily by reducing administrative burdens required by the Government. These lower costs translate to more sales since the government's purchasing power increases. The increased sales means more profit.

Bureaucracy is reduced resulting in less oversight, fewer audits, easier communications, and quicker change approvals. With lower levels of bureaucracy, the contractor is presented with less interpretation items. Another benefit in this category is that the manufacturer is able to use his existing commercial practices in engineering, costing, etc.

Less bureaucracy means more suppliers will be willing to do business with the Government. More suppliers increase competition, lowering prices and improving quality. The increased responsiveness of the supplier base means better delivery schedules and smoother operations.

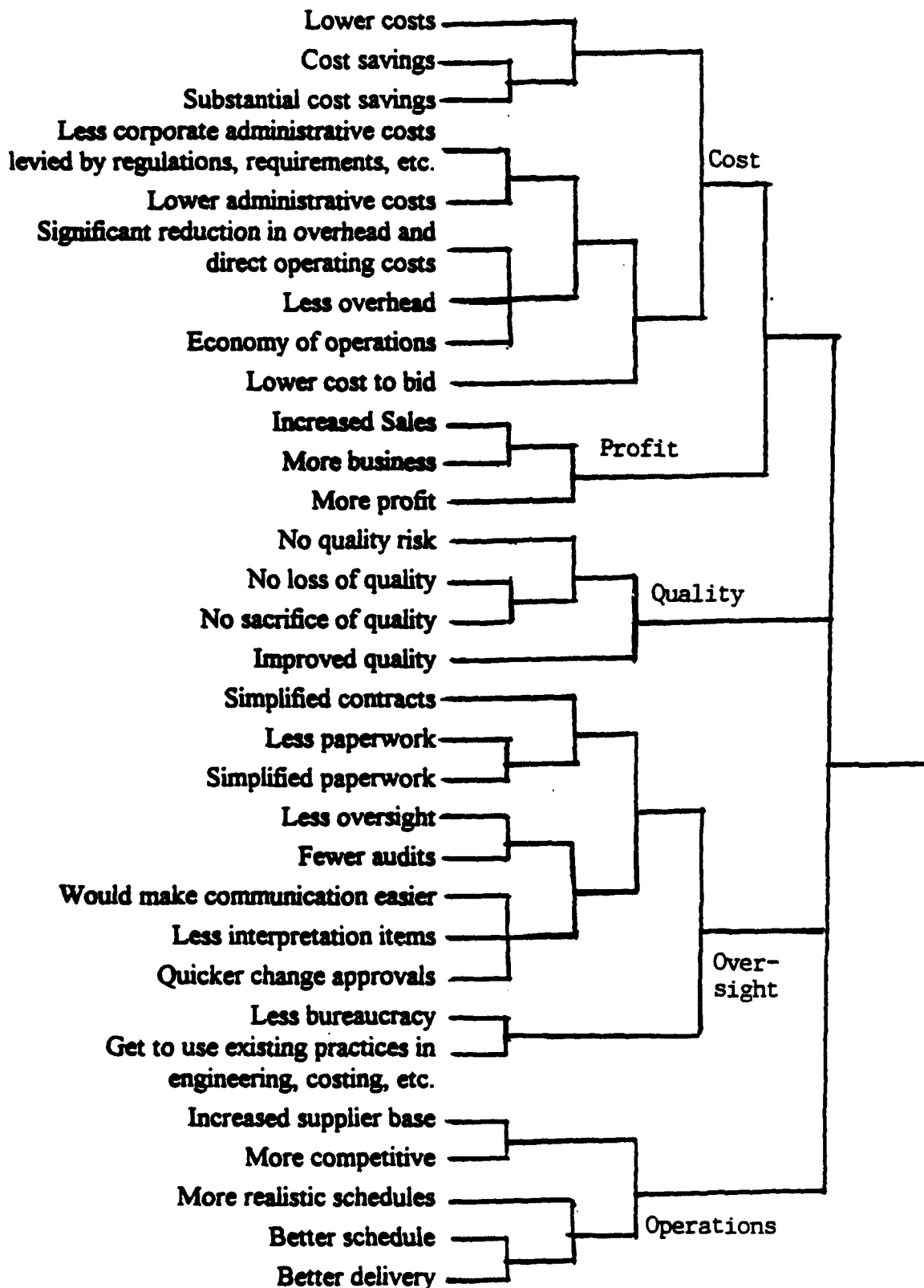


Figure 14. Contractor Benefits

Government Benefits. The net effect of adopting commercial practices is a streamlined acquisition process. Increased competition means better deliveries of products of at least the same, and probably higher quality than under the current system (Figure 15). Cost savings and increased competition incentivizes capital investment by the contractor. This capital investment serves to improve the quality of the products the manufacturer produces.

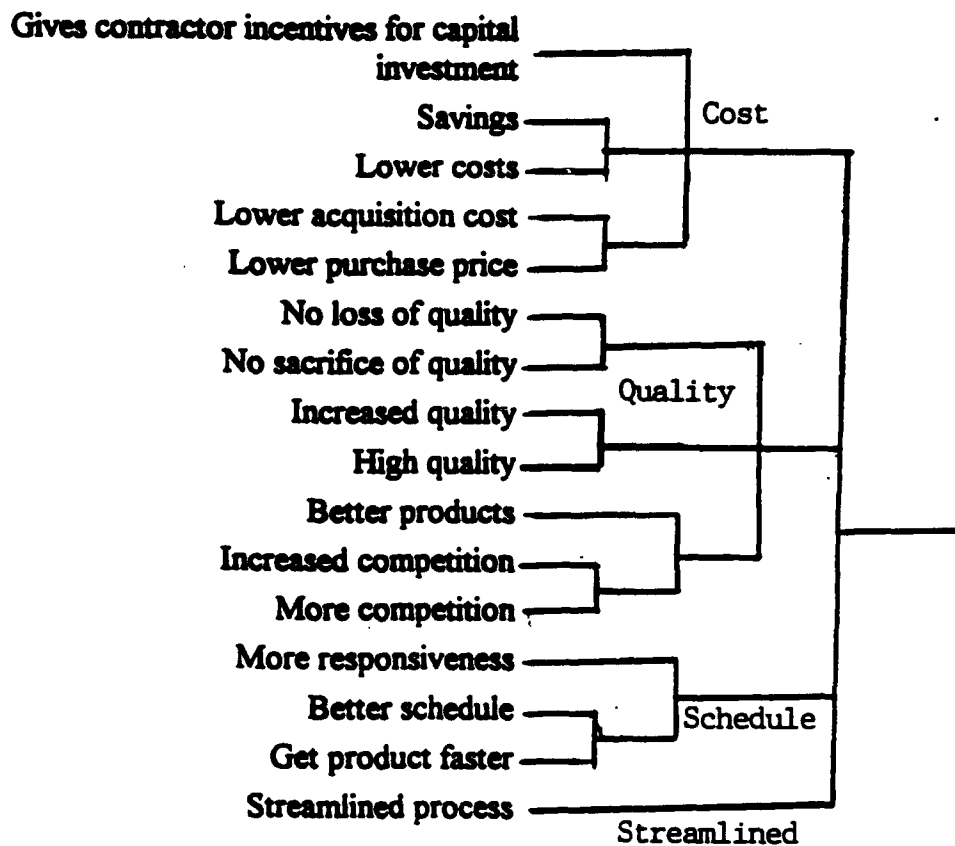


Figure 15. Government Benefits

Summary

This chapter presented the data collected through telephone interviews. Analysis of the data was accomplished by matrixing efforts to logically group responses. Dendrogram analysis presented the interrelationships of the responses. There are definite barriers faced by aircraft manufacturers in supplying commercial aircraft to the Government. Commercial acquisition practices offer a means to alleviate these barriers and provide tangible benefits to the Government and contractors.

Chapter V provides conclusions to the research, proposes an answer to the problem statement addressed in Chapter I, and provides areas of recommended research in the acquisition of commercially available products.

V. Conclusions and Recommendations

Chapter IV provided the findings of the research. Chapter V offers specific conclusions from the findings and recommendations for improving the Government's acquisition process when purchasing commercially available aircraft. The conclusions section provides final answers to investigative question four, "What do contractors perceive as barriers to doing business with government agencies?" The recommendations section provides answers to the fifth investigative question, "Based on the contractors' responses, which commercial practices should the Government adopt?" The final section provides recommendations for further research.

Conclusions

This research study validates the findings of previous studies. There are barriers which discourage contractors from doing business with government agencies. More specifically, this report outlines the difficulties aircraft and airframe manufacturers encounter when performing contracts for aircraft manufactures.

Barriers. The Government intrudes in a business' operations. Additional requirements are imposed. The Government goes beyond the standard product, price, and delivery requirements. Its unique requirements, detailed product descriptions, accounting requirements, bureaucracy and oversight, lack of contract uniformity, and numerous, often onerous clauses place undue burdens on the contractor.

Government Peculiar Requirements. The typical commercial customer is interested in product, price, and delivery when purchasing an aircraft. The research indicates that government agencies demand more from aircraft manufacturers than do commercial customers. The Government imposes socioeconomic requirements on the contractor, directing sourcing and hiring practices. Inspection and quality requirements duplicate, and sometimes go beyond, those already established by the contractor and the

FAA. Government accounting standards are levied on contractors in addition to generally accepted accounting principles (GAAP) and the Financial Accounting Standards Board (FASB) requirements needed in daily business. These additional government accounting standards require extensive use of contractor resources, extensive contractor reporting, and give the Government the right to audit all cost and pricing data. Additionally, the Government requires many of these requirements to be included in contracts with suppliers and subcontractors.

Government Product Descriptions. The Government describes items with excruciating detail. The reason for the detail is product uniformity and increased competition. Contractors view the extensive descriptions and specifications as burdensome and difficult to read and interpret. Specifications are sometimes erroneous and contradictory to other specifications. Contractors complain that the descriptions serve as *design solutions* rather than product requirements. This was illustrated in the dendrogram analysis. To take full advantage of the benefits of commercial products, the contractor needs the freedom to explore alternatives and arrive at the most effective solution.

Creation of Duplicate Systems. Various requirements force the contractor to segregate its business into distinct government and commercial systems. Government accounting requirements add additional overhead in the contractor's operations. They are segregated to prevent these government induced costs from *flowing over* into commercial prices. Government demands for access to data rights often necessitate segregation to ensure protection of proprietary data. Contractors may also be required to segregate their operations by regulation.

Bureaucracy and Oversight. The Government is organized into numerous managerial layers. Each layer conducts its own level of oversight of programs within its

realm. The resulting bureaucracy serves to bar contractors from wanting to do business with the Government.

Bureaucracy. The complexity of the DOD organization makes it difficult for the contractor to know who is really in charge. The bureaucracy is viewed by contractors as self-perpetuating. Several contractors commented that the only reason some people are employed is to justify their employment. The bureaucracy is intrusive, requiring volumes of data which some contractors feel arrive at government agencies too late to allow any proactive managerial decisions. Numerous layers of bureaucracy lengthens the decision making process. The bureaucracy is resistant to change. This is particularly evident in organizations where individuals in any functional area have veto authority of a contractor's change request.

Oversight. Contractors feel that they are constantly second guessed. This second guessing causes inflexibility to system and process change. DOD contractors conduct business with many government agencies. Each agency has its own set of rules, theories, philosophies, and agendas. An adversarial relationship often exists between the contractor and the Government making contractual changes a battle of wills.

Uniformity in Contracts. Contracts are not uniform between government or DOD organizations even though they are governed by the same basic document--the FAR. Clause application varies among the various organizations, but are fairly uniform within an organization. Individual personalities, egos, training, and background do affect program monitoring and interpretation. One contractor stated that interpretations vary among individuals involved in the same program!

Onerous Clauses. The clauses found to be onerous are government contract clauses with no commercial equivalent, and clauses that exist in the commercial world, but their content is substantially different. Any clause dealing with cost rather than price was found to present difficulties for commercial firms. Clauses that establish

sourcing and subcontracting requirements were also found to present problems in the purchase of commercial products, where such decisions have been made prior to contemplation of the contract. Clauses and conditions that establish duplicate and often incompatible testing, inspection and reporting requirements, adversely impact the commercial contractor's cost of doing business and responsiveness.

Recommendations for Improving the System

Based on previous studies and the analysis of the data collected, there are significant cost, competition, and performance benefits available by adopting commercial practices. There are some opportunities under the FAR that are not being fully exploited or are not permitted by agency supplements to be employed. Individuals must be incentivized to seek out these opportunities until permanent regulatory and statutory changes occur. Acquisition officials need to know what is being put into contracts and what is being required of the contractor. If the authors of the requirement do not fully understand it, the contractor cannot be expected to understand them.

A regulation governing commercial acquisition of commercial items is needed. DFARS 211 attempts to provide direction in this area, but falls short in many areas including flow down requirements, socioeconomic requirements, and payments. Many of these requirements are driven by statute. This study, with many other recent studies, contain the specific barriers faced by contractors and readily identifiable benefits of adopting commercial practices for both industry and government. With this information, requests for legislative relief can be formulated that are specific and supportable.

Separate Regulation. As one interview respondent stated, the existing acquisition system cannot be adapted to commercial practices. Commercial practices cannot continue to be an exception. A separate regulation should be issued dealing only with commercial acquisition practices of commercially available products. This should be able to stand

alone, requiring no references to other laws (such as those dealing with socioeconomic issues) or regulations (FAR, DFARS). It should be based on the UCC and no subordinate agency should be given the authority to supplement this regulation.

The document could be limited to a single commodity, such as commercially available aircraft, and expanded later as other industries are examined for barriers and the benefits of adopting commercial practices are demonstrated. This document should be written by representatives from industry and the Government acquisition community.

This single regulation would make it easier for government contracting officers and the manufacturer's contracting officers to understand the contract document. Requirements would be more compatible with commercial practices increasing competition, improving schedule, reducing cost, maintaining quality, and would allow the Government to take advantage of commercial pricing. The need to incorporate clauses by reference would be reduced if not eliminated.

Commercial Payments for Commercial Products. Government payment practices require the contractor to wholly finance a procurement or incur the administrative cost of CAS. Under CAS and standard progress payments up to 20% of the costs are retained until product delivery. These financing costs increase the price of goods the Government purchases. The emphasis on cost rather than price throughout government acquisition is inappropriate for commercial items. Price analysis, rather than cost analysis, should be conducted to determine if a price is fair and reasonable to both parties. Adequate competition, and established market prices ensure a fair and reasonable price.

Payments should be structured based on industry standards. Analysis of industry practices can provide appropriate guidelines. Another, more direct, option is to use the contractor's existing payment structure. The Government has an adequate number of analysts to determine the costs and benefits of such payment plans.

Milestone payments should be authorized for high dollar, low quantity, nondevelopmental programs such as commercial aircraft. The milestones should be identifiable and verifiable (i.e. wings on, engines on, ten hours of flight testing). There is a test of this payment structure already in place in the aircraft industry. The modified commercial payments, issued in the most recent Gulfstream IV buy, can be examined to determine if the predicted cost savings held up in actual practice.

Require Cost Benefit Analysis. It should be recognized and accepted that government clauses and requirements increase the procurement costs of a commercial item. The commercial item is already in production and available to the general public at an established market price. Competition, pride, and fraud laws ensure the manufacturer produces a quality good at a fair and reasonable price.

MILSPECs, MIL-I, MIL-Q, and other MILSTDs must be examined where industry equivalents exist before being included in a commercial contract. In the case of the commercial aircraft, the manufacturer must meet another government agency's requirements--the FAA. Written justification should be required for any testing which is redundant to, or exceeds that required by the FAA. Only those critical components and subassemblies not certified or certifiable by the FAA should be tested by the procuring agency. Many of these standards were created with the specific purpose of monitoring new product development. They have no place in a commercial contract where no development is contemplated or directly financed by the Government.

Remove CAS Requirements. CAS should not be required for acquisitions of commercial products. Acquisition of commercial items should rely on price analysis. The price of the item can be baselined and compared to other products in the market to determine if it is fair and reasonable. Clauses should be developed that reference price, rather than cost, and included in the new regulation recommended above. The contractor

should be allowed to use GAAP and FASB to conduct its financial operations without fear of all of its operations being subject to audit by its government customers.

Commercial Advocacy. A DOD level commercial advocate, reporting to the Under Secretary of Defense (Acquisitions), should be created to monitor and assure maximum use of, and full advantage from, commercial practices. Similar to the position of competition advocate, the commercial advocate would examine ways of conducting business more like a commercial customer. Duties and responsibilities would entail seeking out existing and potential commercial practices which suit the Government's buying behavior and habits (quantity, schedule, etc.). With no additional duties, the commercial advocate is free to seek out new ways of doing business to save the Government and taxpayers money.

Trust the Suppliers. The interviews revealed that there is a tremendous amount distrust and an adversarial attitude from some government acquisition personnel. Aircraft manufacturers, from a competitive standpoint, are just as concerned about the Government getting quality merchandise at a low price. They are not out to intentionally cheat their customers, and they would not survive in the business world if they were. As taxpayers, the individuals have a vested interest to ensure tax dollars are spent wisely. The penalties of getting caught attempting to defraud the Government include debarment, suspension, fines, criminal prosecution and tremendous bad press. The commercial market demands a quality product, advanced features, and a competitive price. Acquisition of commercial products through commercial practices would allow the Government to take full advantage of the market controls, and reduce the administrative burdens and costs required.

Several respondents stated that it seemed as though the entire industry is punished, by way of clause application, oversight, and contract administration, due to past

infractions or the potential for future infractions of individuals. The wholesale application of clauses occupies contractor resources which could be better used elsewhere.

Benefits of Commercial Practices. The dendrogram in Figure 15 and interview responses in Table 7, illustrate the advantages to the Government of adopting commercial style acquisition practices. The main benefit is lower acquisition cost. Overhead is reduced since fewer personnel are required for inspection and audits. Less paperwork means less layers of bureaucracy. The contractor's cost would be reduced as well and be reflected as lower purchase price.

Quality would not be sacrificed and would probably be increased (Figure 14, Figure 15, Table 7). As costs decrease, more competition will enter the market forcing quality improvements for product differentiation. Allowing the manufacturer to choose its suppliers, as it sees fit, ensures the highest quality at the lowest cost. Increased competition would translate to more contractor responsiveness. Since the products would not be built to out of date or erroneous specifications, there would be less rework and more flexibility for contractor proposed design improvements.

Recommendations for Further Research

Based on the reviewed literature and interview responses, this section provides recommendations for further research into the area of commercial style acquisitions. Some of the topics were mentioned briefly in the literature review and analysis chapters of this text. Time prohibited further investigation. Items which appear to warrant further investigation are provided as an aid to future researchers.

Cost Effectiveness of Testing Beyond FAA Standards. One topic of interest uncovered by the researchers is the cost of testing aircraft beyond FAA standards. As previously mentioned, the FAA establishes criteria which an aircraft must fulfill before it can be certified as airworthy. There are costs incurred in exceeding these standards.

These costs include additional test flights. Under current practices, FAA certified pilots must complete certification flights and government personnel may fly duplicate flights. The interviews indicate that there is no value added.

Another example of the additional costs is in terms of program reviews. There is no need to examine the production plan of a manufacturer of commercial aircraft. The manufacturer is already incentivized to produce at the lowest cost to remain competitive in the commercial. The additional review is burdensome and expensive. For example, numerous personnel go TDY for program reviews and additional flight testing of an FAA certified commercially available aircraft. There is additional manufacturing overhead involved to support the influx of people. One respondent stated that over 150 government representatives were present for a recent program review--more than double the number of contractor personnel involved in the project. The cost of sending such an enormous amount of personnel TDY for the time involved in the reviews should also be factored into the cost of the aircraft.

This area could be researched as a series of case studies. Recent contracts can be examined for the cost of TDY visits to the contractor's facilities. The contractor can then be questioned as to what the cost would have been had these visits not occurred.

Cost Effectiveness of Contracted Logistic Support (CLS) vs. Military Support.

The research indicates that the commercial aircraft comes with a warranty based on time in service, use, or a combination of both. These warranties are often very extensive. i.e., one contractor's standard commercial warranty is 7 years parts and labor, not including scheduled maintenance. This warranty can be extended for an additional cost. The benefit of any warranty or extended warranty coupled with the cost of contractor logistics support should be compared to the cost of military support of the aircraft. This is especially true when one or two copies of particular aircraft are expected to be purchased. Certain initial costs could purchase a significant amount of CLS. For example, FAA flight

and maintenance manuals must be written to government specifications as a technical order. There is a cost associated with this rewriting of technical materials. A study should be conducted as to how much CLS could be purchased for the cost involved in rewriting the manuals. This study should include the cost of CLS, cost of rewriting the manuals, and cost of training and retaining government aircraft maintainers.

Cost of Government Payment Practices vs. Commercial Payment Practices. As shown in this project, government and commercial payment practices differ substantially. There is a cost associated with both payment practices. A study examining the differences in the costs associated with each of these payment practices would be valuable to the Air Force and other government agencies alike.

Cost Savings of Using a Standard Commercial Contract vs. a Government Contract. One recommendation of this research is to use standard commercial contracts when acquiring commercially available aircraft. No data was obtained pertaining to the actual cost savings of using standard commercial contracts.

This research could be accomplished as a set of case studies examining the cost of recently purchased aircraft under government contract and the cost of purchasing the same aircraft using the manufacturer's standard commercial contract. How much savings are available, and what risks would the Government incur?

Cost of CAS. Government imposed cost accounting standards increases a contractor's cost of doing business. The costs include the personnel and resources required to implement and maintain a CAS compliant system. The contractor passes these costs on to the consumer--the Government.

A study should be conducted to examine the cost of government cost accounting standards. How much is expended for personnel and dedicated equipment to maintain the certified CAS? What are the risks and costs involved if CAS were not required of government contractors? Again, this study could be in the form of a case study.

Summary

This research was initiated to examine commercial acquisition of aircraft/airframes and determine which commercial acquisition practices are appropriate for the Air Force to adopt. This specific problem was divided into four questions which needed to be addressed to adequately answer the research problem. These questions were (1) What are commercial practices in the commercial aircraft industry? (2) What are typical government acquisition practices in the aircraft industry? (3) How do these practices differ from government acquisition practices? (4) What do contractors perceive as barriers to doing business with government agencies? and (5) Based on the contractors' responses, which commercial practices should the Government adopt?

Chapter II presented a review of current literature pertaining to commercial acquisition practices and government acquisition practices of similar items. The literature revealed several barriers to contracting with the Government. These barriers include oversight, CAS, onerous clauses, and payment procedures.

A research methodology was outlined in Chapter III. Using the barriers found in Chapter II, a survey instrument was designed to verify the existence and determine the extent of these barriers in the commercial aircraft industry. The survey instrument was divided into three parallel questionnaires to account for individual experience in the aircraft industry. Nineteen telephone interviews were conducted over a two week period.

Due to the qualitative nature of the interview response, no statistical tests were used. Interview results were presented in Chapter IV. Data were arranged in matrices to facilitate analysis and answering the investigative questions raised in Chapter I. Data were then presented in the form of dendrograms. The dendrograms showed how interview responses related with each other.

Research conclusions were presented in this chapter. The conclusions section answered Investigative Question Three in more detail. Recommendations for changes to the current acquisition system and benefits to be gained by adopting commercial practices were provided. Recommendations for changes included the following points:

A new regulation should be created to stand separate from the FAR, DFARS, and socioeconomic laws, with no agency supplements.

Adopt a commercial style payment or use the manufacturer's established payment plan linked to identifiable, verifiable milestones.

A cost benefit analysis should be conducted for any clause, MILSPEC, MILSTD, etc., which exceeds FAA requirements.

Remove the CAS requirement from contractors and rely on generally accepted accounting principles and the Federal Accounting Standards Board.

A commercial advocate, reporting to the Under Secretary of Defense (Acquisitions), should be appointed to seek out opportunities to use existing and emerging commercial practices.

The Government should recognize the impact and the controls the commercial market place has on its suppliers. Using these controls will allow the supplier to supply high quality, reasonably priced goods to the Government.

Finally, although not a recommendation, the benefits of adopting commercial practices are reviewed.

The last section of this chapter provided recommendations for further research. These areas were raided during the literature review and interview process. Time and scope limitation prevented further investigation.

The Government must look at the way it does business. Current practices alienate potential contractors from entering into contracts. The Government's past performance

makes it a less than desirable customer. Government unique requirements must be examined to determine their true value.

At the time of this writing, ASC/SDCK is heading up a Critical Process Team (CPT) consisting of representatives from the aircraft industry and the Government acquisitions community. It was discovered during the interview process that some interviewees were participating on the CPT. The results of this research effort will be included in the team's proceedings.

The manufacturing community is faced with extensive foreign competition. It must change its methods to compete in the world market. As a customer of the manufacturing community, the Government must adapt to global market changes. Procedure reviews and changes must occur on an ongoing basis to take advantage of industry advances.

Appendix A: Initial Contact Letter and Response Sheet

«name1» «name2», «title»
«Company»
«Division»
«address1»
«address2»
«city», «state» «zipcode»

10 June 1992

«Salut» «name2»,

With shrinking defense dollars it is imperative that funds be spent wisely. One recommendation is to increase the use of commercial items and adopt commercial acquisition practices. I am asking you, or a representative of your company knowledgeable in your contracting practices, to participate in research focused on the application of commercial style acquisition practices to Air Force procurement of commercially available aircraft.

I am the thesis advisor of two Air Force Institute of Technology (AFIT) Students, Captain Doug Humerick and Captain Steve Minnich. As part of their research they are incorporating the results of telephone interviews with domestic aircraft manufacturers. The interview questions will cover perceived barriers to doing business with the government, roadblocks to commercial style acquisition, and the potential benefits to adopting commercial procedures. The interviews will be structured around a questionnaire that will be provided prior to the interview. The interviews are planned for mid to late June and will be scheduled at your convenience.

If you, or a representative you could recommend, would be willing to participate, I believe it would add valuable substance to their research. If your company has separate government and commercial divisions selling the same or similar products, they would like to interview a representative of each division.

Thank you for your consideration of this request. A form and a return envelope is enclosed for your convenience. I can also be reached at (513) 255-4845

Michael E. Heberling, Ph.D.
Lieutenant Colonel, USAF
Head, Department of Graduate Acquisition Management

Atch.

I will participate. (please note any corrections)

«Company»
«Division»
«name1» «name2», «title»
«address1»
«address2»
«city», «state» «zipcode»

Name: _____ **Title:** _____

Address: _____

City: _____ **State:** _____ **Zipcode** _____

Telephone: _____

The Best Time(s) To Contact: _____

I will participate, and the individual(s) below will represent our company.
or

I will be unable to participate, however, the individual(s) below will represent our company.

Name: _____ **Title:** _____

Address: _____

City: _____ **State:** _____ **Zipcode** _____

Telephone: _____

The Best Time(s) To Contact: _____

Name: _____ **Title:** _____

Address: _____

City: _____ **State:** _____ **Zipcode** _____

Telephone: _____

The Best Time(s) To Contact: _____

Our Company is unable to participate.

Appendix B: Contact Letter for Referrals Beyond Initial Contacts

<NAME>

DATE

<Company>

<Address>

<Name>,

Mr. < > from the Transport Division of Aeronautical Systems Center, Wright Patterson AFB, recommended we ask you to participate in a telephone interview to support research focused on the application of commercial acquisition practices to Air Force procurement of commercially available aircraft. We are graduate students at the Air Force Institute of Technology (AFIT) working towards completion of our thesis. Your participation, via the interview, will add valuable substance to our research. Through these interviews we are attempting to gain a better understanding of commercial practices, barriers contractors encounter when entering into contracts with the government, roadblocks to commercial style acquisition, and the potential benefits to adopting commercial procedures. The ultimate purpose of the research is to find ways to improve the acquisition process.

There are three questionnaires attached. The one most appropriate for your experience will be used for the interview. The questions are designed to encourage discussion and guide the interview. The space provided on these questionnaires will, in most cases, be less than what is needed to fully answer the question and merely provides space for you to make notes or jot down reminders in preparation for the interview. We anticipate the interview to last approximately 30 - 45 minutes, but we are constrained only by your generosity with your time. We will telephone you shortly to confirm your participation and set a convenient time for the interview.

Any comments and suggestions on this research will be appreciated. We thank you in advance for participating in this important research.

Sincerely,

Capt Douglas W. Humerick, USAF
537 Lewis Drive
Fairborn, OH 45324
(513) 879-4249

Capt Steven H. Minnich, USAF
109 Villa Drive
New Carlisle, OH 45344
(513) 845-4296

Or: Air Force Institute of Technology/LAS
Attn.: Lt Col Heberling (Thesis)
Wright-Patterson AFB, OH 45433
Telephone (513) 255-4845 FAX (513) 255-8458

Atch.

Appendix C: Questionnaire Cover Letter

«name1» «name2», «title»

<Date>

«Company»

«Division»

«address1»

«city», «state» «zipcode»

«salute». «name1» «name2»

Your name was provided to us by < > to represent your company in a telephone interview to support research focused on the application of commercial acquisition practices to Air Force procurement of commercially available aircraft. We are graduate students at the Air Force Institute of Technology (AFIT) working towards completion of our thesis. Your participation, via the interview, will add valuable substance to our research. Through these interviews we are attempting to gain a better understanding of commercial practices, barriers contractors encounter when entering into contracts with the government, roadblocks to commercial style acquisition, and the potential benefits to adopting commercial procedures. The ultimate purpose of the research is to find ways to improve the acquisition process.

There are three questionnaires attached. The one most appropriate for your experience will be used for the interview. The questions are designed to encourage discussion and guide the interview. The space provided on these questionnaires will, in most cases, be less than what is needed to fully answer the question and merely provides space for you to make notes or jot down reminders in preparation for the interview. We anticipate the interview to last approximately 30 - 45 minutes, but we are constrained only by your generosity with your time. We will telephone you shortly to set a convenient time for the interview.

Any comments and suggestions on this research will be appreciated. We thank you in advance for participating in this important research.

Sincerely,

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537 Lewis Drive
Fairborn, OH 45324
(513) 879-4249

Capt Steven H. Minnich
109 Villa Drive
New Carlisle, OH 45344
(513) 845-4296

Or: Air Force Institute of Technology/LAS
Attn.: Lt Col Heberling (Thesis)
Wright-Patterson AFB, OH 45433
Telephone (513) 255-4845 FAX (513) 255-8458

Atch.

Appendix D: Interview Questionnaires

Thesis Interview Background

Interview Objective:

To solicit opinions of acquisition contracting practices for commercially available aircraft within DOD. Specifically, identifying:

- what contractors perceive as barriers and how they affect cost and delivery of the system and
- how private firms contract for similar item.

General Comments:

- a. Your opinions may not necessarily be the official opinion of your organization. If requested, your identity, as well as your organization's identity, will be held in strictest confidence. No statement will be made in the thesis reflecting your name, your organization, or participation or non-participation other than to state the number of respondents. Your name and organization will be held by the researchers in order to send the appropriate appreciation for participating in the interview.
- b. The questions asked may not fully address your opinions or experience. The questions are intentionally open ended to allow you to elaborate to whatever extent you feel adequate. You may decline to answer any or all questions, however, your honest opinions are vital to the success of this research.

Selecting the Appropriate Questionnaire:

If you have no personal experience with government contracts, the interview will follow questionnaire one.

If you have no personal experience with commercial contracts (strictly deal with government contracts), the interview will follow questionnaire two.

If you have personal experience in both government and civilian contracts, the interview will follow questionnaire three.

Demographic Data

Company/Organization (Include Division if applicable): _____

Name: _____

Position/Title: _____

Please describe your duties: _____

How long have you been in the aircraft industry: _____

What is the primary business of your organization (Manufacturing, Reconditioning, Parts Supplier, ...etc.): _____

What is your companies annual sales?

\$: _____

Units: _____

What % of the above are sales to U.S. Government agencies?

\$: _____

Units: _____

How many people are employed by your company? _____

How many people are in your immediate organization? _____

QUESTIONNAIRE 1

No personal Government Experience

1. Does your company sell to the US Government? _____ If not, please continue with question 3. If your company does please continue with question 2.
2. Does your company segregate commercial and government business? _____ If not, please continue with question 3.

How are the operations segregated? (separate plants, production lines, work areas, accounting centers, ... etc.)? _____

Why are the operations segregated?(Cost, Accounting requirements, Easier, ... etc.)? _____

3. Who are your key customers? _____

4. How long is a typical contract? (number of pages or other measure that would be descriptive)

5. How many clauses are used? _____

What are the significant clauses to you? _____

What clauses do you believe to be most significant to your customers? _____

6. How are the items to be purchased described?(Standard product description, detailed specifications, technical specifications, functional specifications, etc.) _____

7. How are payments typically structured? _____

8. What barriers do you see in doing business with the government? _____

9. What problems would your organization have in doing business with the government? ____

10. Has your organization elected not to pursue a contract with a government agency because of problems with contracting with the government? _____ If yes what were the reasons?

11. If you were in charge of government acquisition policy, what would be the first thing you would change? _____

What would be the second change you would make? _____

What would be the final change you would make? _____

12. What benefits, if any would your company/organization see from the government adopting more commercial practices? _____

13. Do you have any comments or statements that have not been covered in the previous questions that you feel are relevant to this research? _____

QUESTIONNAIRE 2
No Personal Commercial Experience

1. Does your company sell to commercial customers? _____ If not, please continue with question 3. If your company does please continue with question 2.
2. Does your company segregate commercial and government business? _____ If not, please continue with question 3.

How are the operations segregated?(separate plants, production lines, work areas, accounting centers, ... etc.)? _____

Why are the operations segregated? (Cost, Accounting requirements, Easier, ... etc.)? _____

3. Who are your key customers? _____

4. What problems, if any, attributable to contracting practices, policies, requirements, have you had in doing business with the Government? _____

5. How long is a typical contract? (number of pages or other measure that would be descriptive)

6. How many clauses are used? _____

What are the significant clauses to you? _____

What, do you believe, are the significant clauses to your customers? _____

What clauses, if any, do you find to be particularly onerous? _____

Have you tried to get the contracting officer to make changes to these clauses? _____

Have you been successful? _____

How long did resolution take? _____

Are you familiar with any commercial clauses which would be more appropriate? _____

7. How are the items to be purchased described? (Standard product description, detailed specifications, technical specifications, functional specifications, etc.) _____
-

What problems, if any, have you or your company experienced with government specifications?

8. How are payments typically be structured? _____
-

What problems, if any, have you experienced with Government payment practices? _____

Are you familiar with civilian payment practices? _____ If so, What are the differences?

What should payment practices be? _____

9. Does your organization have an Government approved Cost Accounting System (CAS) and follow the CAS standards? _____

Does CAS create a significant burden or barrier to contracting with the government? _____ If so, in what way? _____

What changes or alternatives to CAS would you suggest? _____

10. How would you describe the uniformity of contracts and the consistency in clause application? _____

11. How do Government personnel transfers affect the relationship between you, the contractor, and the Government? _____

12. What evidence of acquisition reform, if any, have you seen to allow the Government to adopt commercial practices in purchasing commercially available aircraft? _____

Has it been effective? _____ Why/why not? _____

What needs to be done? _____

13. What, if any, commercial practices are you aware of that are routinely used in your organization's contractual relations with the government? _____

14. Has your organization elected not to pursue a contract with a government agency because of problems with contracting with the government? _____ If yes, what were the reasons? _____

15. If you were in charge of government acquisition policy, what would be the first thing you would change? _____

What would be the second change you would make? _____

What would be the final change you would make? _____

16. What benefits, if any, would your company/organization see from the government adopting more commercial practices? _____

17. What benefits, if any, do you believe the Government would see from adoption of more commercial practices? _____

18. Do you have any comments or statements that have not been covered in the previous questions that you feel are relevant to this research? _____

QUESTIONNAIRE 3
Both Government and Commercial Experience

1. Does your company sell to commercial customers? _____ If not, please continue with question 3. If your company does please continue with question 2.
2. Does your company segregate commercial and government business? _____ If not, please continue with question 3.

How are the operations segregated? (separate plants, production lines, work areas, accounting centers, ... etc.)?

Why are the operations segregated? (Cost, Accounting requirements, Easier, ... etc.)?

- _____
3. Who are your key customers? _____
 - _____
 - _____
 4. What problems, if any, attributable to contracting practices, policies, requirements, have you had in doing business with the Government? _____
 - _____

5. How long is a typical contract? (number of pages or other measure that would be descriptive)

Commercial: _____

Government: _____

6. How many clauses are used?

Commercial: _____

Government: _____

What are the significant clauses to you?

Commercial Contracts: _____

Government Contracts: _____

What, do you believe, are the significant clauses to your:

Commercial customers? _____

Government Customers? _____

What Government clauses, if any, do you find to be particularly onerous? _____

Have you tried to get the contracting officer to make changes to these clauses? _____

Have you been successful? _____

How long did resolution take? _____

What commercial clauses, if any, would be more appropriate? _____

7. How are the items to be purchased described? (Standard product description, detailed specifications, technical specifications, functional specifications, etc.)

Commercial: _____

Government: _____

What problems, if any, have you or your company experienced with government specifications?

8. How are payments typically be structured?

Commercial: _____

Government: _____

What problems, if any, have you experienced with Government payment practices? _____

What should Government payment practices be? _____

9. Does your organization have an Government approved Cost Accounting System (CAS) and follow the CAS standards? _____

Does CAS create a significant burden or barrier to contracting with the government? _____ If so, in what ways? _____

What changes or alternatives to CAS would you suggest. _____

10. How would you describe the uniformity of contracts and the consistency in clause application in government contracts? _____

11. How do Government personnel transfers affect the relationship between you, the contractor, and the Government? _____

12. What evidence of acquisition reform, if any, have you seen to allow the Government to adopt commercial practices in purchasing commercially available aircraft? _____

Has it been effective? _____ Why/why not? _____

What needs to be done? _____

13. Has your organization elected not to pursue a contract with a government agency because of problems with contracting with the government? _____ If yes what were the reasons?

14. If you were in charge of government acquisition policy, what would be the first thing you would change? _____

What would be the second change you would make? _____

What would be the final change you would make? _____

15. What benefits, if any, would your company/organization see from the government adopting more commercial practices? _____

16. What benefits, if any, do you believe the Government would see from adoption of more commercial practices? _____

17. Do you have any comments or statements that have not been covered in the previous questions that you feel are relevant to this research? _____

Appendix E: Identification of Interview Questions with Investigative Questions

Investigative questions:

1. What are commercial practices in the commercial aircraft industry?

- 1-4, 2-5, 3-5 Length of contract
- 1-5, 2-6, 3-6 Number of clauses
- 1-5, 2-6, 3-6 Significant clauses (contractor and customer)
- 1-6, 2-7, 3-7 Product description
- 1-7, 2-8, 3-8 Payment structure

2. What are the government practices in acquiring commercial aircraft?

- 1-4, 2-5, 3-5 Length of contract
- 1-5, 2-6, 3-6 Number of clauses
- 1-5, 2-6, 3-6 Significant clauses (contractor and customer)
- 1-6, 2-7, 3-7 Product description
- 1-7, 2-8, 3-8 Payment structure
- 2-9, 3-9 CAS
- 2-10, 3-10 Uniformity of contracts and clause application
- 2-11, 3-11 Impact of personnel transfers

3. How do commercial practices differ from government acquisition practices?

- 1-2, 2-2, 3-2 Segregation of business
- 1-4, 2-5, 3-5 Length of contract
- 1-5, 2-6, 3-6 Number of clauses
- 1-5, 2-6, 3-6 Significant clauses (contractor and customer)
- 1-6, 2-7, 3-7 Product description
- 1-7, 2-8, 3-8 Payment structure
- 2-9, 3-9 CAS
- 2-10, 3-10 Uniformity of contracts and clause application
- 2-11, 3-11 Impact of personnel transfers

4. What do contractors perceive as barriers to doing business with government agencies?

- 2-4, 3-4 What are the problems experienced in contracting with government?
- 1-5, 2-6, 3-6 Significant clauses
- 2-6, 3-6 Onerous government clauses
- 2-6, 3-6 Changes to the contract clauses
- 1-6, 2-7, 3-7 Product description
- 2-7, 3-7 Problems with government specifications
- 1-7, 2-8, 3-8 Payment structure
- 2-8, 3-8 Problems with government payment practices
- 1-8 What are perceived barriers to doing business with the government
- 1-9 What problems would you have doing business with the government
- 2-9, 3-9 CAS
- 2-10, 3-10 Uniformity of contracts and clause application
- 2-11, 3-11 Impact of personnel transfers
- 1-10, 2-14, 3-13 Ever elect to not pursue a contract with the government

5. Based on the contractors' responses, which commercial practices should the government adopt? (What are the benefits of adopting commercial practice to the contractor and to the government?)

- 2-6, 3-6 Changes to the contract clauses
- 2-6, 3-6 Commercial clause to appropriate to adopt
- 1-6, 2-7, 3-7 Product description
- 2-8, 3-8 What should government payment practices be?
- 2-9, 3-9 CAS/recommendations
- 2-10, 3-10 Uniformity of contracts and clause application
- 2-11, 3-11 Impact of personnel transfers
- 2-12, 3-12 Evidence of acquisition reform to allow commercial practices
- 2-13 Commercial practices in use
- 1-11, 2-15, 3-14 If you were king....
- 1-12, 2-16, 3-15 What would be the benefits, contractor
- 1-13, 2-17, 3-16 What would be the benefits, government

Appendix F: Tables of Matrices

TABLE 3: CLAUSE APPLICATION

TABLE 4: TYPICAL CONTRACT PRACTICES

TABLE 5: DIFFICULTIES CONTRACTING WITH GOVERNMENT

TABLE 6: CONTRACTOR RECOMENDATIONS

TABLE 7: BENEFITS OF COMMERCIAL PRACTICES

TABLE 3
CLAUSE APPLICATION

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
A 1				No experien ce	6 - 7 inches thick to several thousand pounds
A 2			Base adjustment Firm Fixed Price 200 + clauses (agency specific)	No experien ce	6 - 7 inches thick to several thousand pounds
A 3	Mutuality of obligations What to do Delivery Payments ----- - Statement of Work Schedule Payments	Product Payments Delivery	How to build Who to hire Sourcing Socioeconomic FAR SOW SPECS	25 + attachme nts 75 Maximum	300 - 800 (600 average)

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**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
B 1	Delivery Payments Termination Default Warranty ----- - Delivery Payments Termination Default Warranty (extended at no extra cost) Liquidated damages Changes Termination for convenience Others	Delivery Comply contractually		8 - 10 Pages	100 - 200 pages
C 1	Price Terms Specified Delivery ----- --	Price Risk Management Liabilities		28 Pages	No experien ce

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**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
C 2		No experience	Too many - 176 clauses	28 Pages + warranty	Can't define typical; most recent Air Force 307 Pages
C 3	----- -- Cost Audit CAS	No experience	Unsure of	28 Pages + warranty	Cannot quantify response
C 4		Cost Delivery Acceptance Payment Training (pilot and mechanics) Warranty	TINA CAS Data Rights Any clause pertaining to costs	28 Pages + warranty 16 Articles , 52 sections	Can't define typical Most recent Air Force contract - 307 Pages
C 5		Delivery Price Warranty	CAS	28 Pages	307 Pages

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**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
D 1	Invest/cash flow Buy in Equity partner rather than subcontract ----- - Extended warranty Payments Work performance requirements	Live up to contract Delivery Performance Delivery schedule	Production plan SOW	Typical 20 Up to 300 for multi- year procurem ent	20 - 40 at low end to over 1000
E 1	FAA certified Price Delivery Taxes Warranty ----- - Take what is dealt	Delivery date (except for allowable delays) Payment Warranty	Socioeconomic clauses Lowest Cost Specification s	2 Pages	No current governme nt contract s. Parts only.

**** Company/Respondent Number**

**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
F 1	Delivery Price Options Penalties Warranty ----- - Payments Quality Small Business OSHA CAS Unallowable overhead	Product Delivery date Price	Product Delivery date Price Payments Quality OSHA CAS	5 - 10 pages (up to 30 -40 pages if complica ted	278 pages + changes
F 2	Progress Payments Delivery Liabilities for early/late delivery Training Warranty ----- - Unknown		Nickel and dime you with clauses	4 Pages (fill in the blanks)	80 Pages

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**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
G 1	Payment Warranty (operational use vs time) Market/Quantit y guarantee ----- - Amortization of non- recurring costs Risk on reduction of quantity guarantees Financing as an allowable cost Warranty (time vs use)	Payment Warranty (operational use vs time) Market/Quantit y guarantee	CAS	No standard commerci al contract	Not quantifi able Typical only within agency Commerci al more flexible typicall y shorter warranty period

**** Company/Respondent Number**

**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
H 1	Payment Delivery Warranty Description ----- - Payment Delivery Warranty (less stringent than commercial) Description Reporting Accounting	Payment Delivery Warranty Description	MILSTD 9858	3 - 4 Pages	Hundreds of pages No typical contract

** Company/Respondent Number

**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
I 1	<p>----- -</p> <p>Progress Payments;</p> <p>Ground Flight Risk;</p> <p>Order of Precedence;</p> <p>Government furnished property; liquidated damages</p>		<p>All clauses</p> <p>Liquidated Damages</p> <p>Latent defects</p> <p>Data Rights</p> <p>Warranty</p> <p>Inspection</p> <p>Defective cost or Pricing Data</p> <p>Quality</p> <p>Recoupment</p> <p>Small business</p> <p>MIL-I</p> <p>MIL-Q</p>		<p>100 - 1500 (functio n of attachme nts)</p>

**** Company/Respondent Number**

**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
I 2	Delivery Penalty Fees Special Equipment Certification Warranty Operational life of aircraft (sometimes) ----- - Basically same - more detailed Delivery Penalty Fees Special Equipment Certification Warranty Operational life of aircraft (sometimes)	Rarely push beyond standard contract		5 - 6 Pages	Massive

** Company/Respondent Number

**TABLE 3 (CONT'D)
CLAUSE APPLICATION**

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
J 1	Warranty Payment Terms Inspection and Acceptance Indemnity Provisions Termination delivery Schedule ----- -- CAS Socioeconomic clauses Payment Warranty Government property, tooling, facilities Cost or pricing Data Changes Inspection Delivery	Warranty Payment Terms Inspection and Acceptance Indemnity Provisions Termination delivery Schedule	CAS Socioeconomic clauses Payment Warranty Government property, tooling, facilities Cost or pricing Data Changes Inspection Delivery	Contract is 30 - 50 Pages Specs - 100 pages	Contract - 1000 or more pages Specs - several thousand pages (if incorpor ated rather than included by referenc e)

**** Company/Respondent Number**

TABLE 3 (CONT'D)
CLAUSE APPLICATION

**	Contractor Interests (commercial/ government customers)	Commercial Customer Interests	Government Customer Interests	Length of Commerci al Contract	Length of Governme nt Contract
K 1	Warranty Other standard items Price Delivery Liquidated Damages ----- --	Same Warranty Other standard items Price Delivery Little negotiation		4 Pages	Purchase order for parts only

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TABLE 4
TYPICAL CONTRACT PRACTICES

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
A 1	No experience	Typical Progress 80% of costs	No experience	Try to provide design solution rather than requirements	
A 2	No experience	Typical Progress 80% of costs	No experience	Detailed Specs	Commercial typically receive quarterly payments; DOD typically balance at delivery
A 3	Advanced payments based on time to delivery Balance on delivery		Functional requirements with some technical specs that are much simpler than the government's	MILSPECS	DFARS is used since FAR changes are difficult. The two bodies are very duplicative. DFARS 211 is a failure.

** Company/Respondent Number

**TABLE 4 (CONT'D)
TYPICAL CONTRACT PRACTICES**

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
B 1	<p>Deposit (10%)</p> <p>Progress based on time until delivery (3 - 4 payments)</p> <p>Balance on delivery</p>	<p>Slowly</p> <p>Standard progress payments</p>	<p>Model specifications (incorporated into contract)</p>	<p>Technical specification and standard product description</p>	<p>MILSTDS may reflect lower quality</p> <p>Problems with interpretation</p> <p>Specs go beyond FAA</p> <p>Problems with Prompt Payment Act</p> <p>Payment can get held up at any level, contractor must track down</p> <p>Provide extended warranty at no extra cost to the government</p>
C 1	<p>10% Down</p> <p>40% 6 months from delivery;</p> <p>50% at delivery</p>	<p>No experience</p>	<p>Detailed specs</p>	<p>No experience</p>	

** Company/Respondent Number

**TABLE 4 (CONT'D)
TYPICAL CONTRACT PRACTICES**

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
C 2	<p>10% Down</p> <p>40% 6 months from delivery;</p> <p>50% at delivery</p>	<p>Program support - negotiated annually, paid monthly</p> <p>Progress payments - pass through to CAS approved subcontractor</p> <p>Spares - on delivery</p>	No experience	Detailed Specs	<p>Don't reveal costs to commercial customer</p> <p>Government pays for additional imposed hassles</p>
C 3	No experience	<p>Program support - negotiated annually, paid monthly</p> <p>Progress payments - pass through to CAS approved subcontractor</p> <p>Spares - on delivery</p>	No experience	Detailed Specs	Government audits to ensure payments are made to subcontractors take months before prime is reimbursed
C 4	<p>Good faith down payment</p> <p>milestone payments</p> <p>Balance on deliver</p> <p>Pays for investment</p> <p>Minimize cash flow and capital investment</p>			Only accept specific action in our format and only if not incorporating others	<p>Government payment practices no worse than any other contractor</p> <p>Specs Typically go beyond FAA</p>

** Company/Respondent Number

**TABLE 4 (CONT'D)
TYPICAL CONTRACT PRACTICES**

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
C 5	10% Down 40% 6 months from delivery; 50% at delivery		Functional and FAA specification	Detail spec and mix of standard product description, technical specs, functional spec	<p>Can't do maintenance on our own aircraft because we won't sign up to safety MILSPEC</p> <p>There are a lot of good govt specs, we use some in our production</p> <p>Some specs reference and/or supersede others</p> <p>Difficult to fish through</p> <p>Some spec contradict others</p> <p>Don't recognize the time value of money</p>

** Company/Respondent Number

TABLE 4 (CONT'D)
TYPICAL CONTRACT PRACTICES

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
D 1	Time of delivery net 30	Monthly for cost reimbursement Progress for FFP	Product descriptions, drawings	Part number to generic system spec	Spec doesn't affect performance Balancing program cost with risk Time to change spec - government encourages tailoring of spec not approve at answer to RFP Unwilling to improve milestone billing
E 1	Deposit Balance on delivery Validate money ahead	Progress payments or DD 250	Functional - buy plane with a warranty	Detailed spec - certify lowest cost to commercial customer, get IFB Standard Product Description Technical specs Functional specs	Specs poorly defined Writers can't define need vs. requirement Readers don't understand logic or what is desired Government can't manage interest, build into price

** Company/Respondent Number

**TABLE 4 (CONT'D)
TYPICAL CONTRACT PRACTICES**

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
F 1	Down Payment Balance on delivery	Break into line items Paid monthly for some work under commercial invoice, others require DD 250	Standard product description plus options	Detail specs	Specs are too stringent don't know why they must be so detailed MILSPEC adds paperwork beyond commercial spec Timely payments (as quick as anyone else) Duplication of paperwork Electronic transfer payments are even better Pay a month behind commercial
F 2	Down Payment Milestone payments Balance at delivery Guarantees price/position		Detailed Spec Model specification Product Description Standard Specs + options More definitive specs if special purpose	Detailed Spec	Too many specs Not timely payments Cleared up 60 days after service Gets priced into proposal

** Company/Respondent Number

TABLE 4 (CONT'D)
TYPICAL CONTRACT PRACTICES

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
G 1	Down Payment Progress payments Balance at delivery	Progress Liquidation on delivery	Functional spec General operating envelope and performance Meet FAA requirements	MILSPEC	Commercial customer has no inspectors MILSPEC too detailed, too much involvement Too many specs Five more leeway Interpretation should be tailored to end use Govt plans for extreme rather than what will actually be encountered Let's be realistic Payment provision could lower cost to government

** Company/Respondent Number

**TABLE 4 (CONT'D)
TYPICAL CONTRACT PRACTICES**

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
H 1	Down payment 1 Progress payment (Flat amount) Balance on delivery	Straight forward progress payment	Specification description book for each plane manufacture - configuration stand, Options	MILSPEC	Government could buy just as easily with commercial description Specs go beyond FAA certificatio n Paid late if no late payment clause (govt) Provide extended warranty at no extra cost to government
I 1	No experience	Progress payments using invoice (paid 30 days after work performed)	No experience	Detailed specs or combinat ion of function al and model specs	Commercial generally down payment, milestone payments based on physical progress net 30 Specs typically go beyond FAA Unreasonable specs Conflicting specs Milspec - branch out and reference others

**** Company/Respondent Number**

**TABLE 4 (CONT'D)
TYPICAL CONTRACT PRACTICES**

**	Commercial Payments	Government Payments	Commercial Product Description	Government Product Description	Other
I 2	No experience		Work order Specification		Specs too detailed So extensive/exhaustive that it is hard to know if you covered all the bases DD 250 Withhold pending resolutions
J 1	Advance payments plus milestone payments with irrevocable letter of credit	Progress payments with incurred costs and liquidation upon delivery (DD 250)	Standard product description	Detailed specs	Detailed specs unclear and misleading Time consuming to process progress payment and paper work requirement. No consideration for contractor investment of money.
K 1	Deposit, balance on delivery (letter of credit) Currently evolving to progress with balance at delivery	No experience	Standard Product description	No experience	Purchaser-written contract is very different than seller-written contract

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TABLE 5
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
A 1	Segregated by: plant production line work areas accounting centers ----- Cost accounting integrity No cost flow over to commercial customers			Vary by agency	
A 2	Segregated by: plant production line work areas accounting centers ----- Mainly accounting Pain Commercial customers don't want any part of it	Data rights Firm Fixed Price	CAS tracking, justification s, managerial restrictions, extensive resource requirements Forces uniformity among our divisions	Fairly uniform Varies by agency, but not much in a particular system	

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
A 3	Administrati ve ----- -- Natural separation Data rights Cost and pricing data requirements	Terms, conditions, requirements not compatible with commercial products Tech Data Audit Accounting Price/cost MILSPECS and MILSTDS different from commercial Inspections Socioeconomic	Grown, intrusive Adversarial relationship Contractor assumes risk Contracting officers don't perceive their own authority. too much second guessing. Little discretion	FAR is aimed at this. Mandatory provisions vary by agency. There are renegade clauses with no apparent controls or ways of tracking.	The system is broken. Seems government thinks it's not good to make a profit. Fixed price development The process is criminalized --don't work out together, forced to go to court and litigate rather than negotiate Can't do commercial business with DOD on an exception basis. Can't do changes under this system and make it work.

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
B 1	Treat as one more customer ----- -	Attempts for exceptions tend to drop from consideration for award Changes Termination for Convenience Liquidated damages Default Inspections (no criteria)	CAS designed to protect government Not necessary for all contracts or all companies Complex Paperwork	Same clauses Subject to interpreta tion and how closely they administer the contract Varies by individual s involved in the same program Govern numerous personnel with rules. It seems that they make up interpreta tions.	Requirements imposed on contractor Lack of understandin g Company sends the top executives to go forth to negotiate sales. Government sends inexperience d personnel at low level. Adversarial nature-- Government thinks all contractors are out to put one over on them.
C 1	Operationall y Separate Government Sales office ----- -				Govt should use more UCC UCC seems to modified by congress

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
C 2	Not segregated ----- - 	Certified cost and pricing data Any cost requests Progress Payments CAS		Varies by service, division, ALC Different approaches Different personalit ies	Acquisition people are too 'Reg Conscious'; Don't want to explore alternatives
C 3	Separate department to handle government business. Familiar with specificatio ns, regulations, etc. ----- To keep us out of trouble	Safety Quality Cost Audit CAS Ground and Flight Risk Payments Deviations may be career limiting	CAS not cost effective	Each contract is different Vary by personalit y Main difference is between organizati ons	Government contracting officers don't know the other side Use common sense - can't apply all clauses to all situations

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TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
C 4	<p>Program office dedicated to military</p> <p>-----</p> <p>Don't want government induced cost to 'creep' into commercial and influence commercial price unnecessaril y</p>	<p>Capital cost of money</p> <p>Price certification</p> <p>Hazardous materials</p> <p>Data rights</p> <p>Production progress</p> <p>Change order accounting</p> <p>Termination for convenience</p> <p>Any dealing with costs</p> <p>Termination</p> <p>Defective pricing</p> <p>Integrity of unit price</p>	<p>CAS is a cop out for the auditing world</p> <p>Additional cost--no benefit</p> <p>Too many players in decision making</p>	<p>Varies by agency-- different theory, sets of clauses</p> <p>Only consistenc y is those clauses mandated by law</p>	<p>Contracting officer doesn't look at clauses, expects contractor to look at them</p> <p>Waivers are by contract, not by organization or activity</p> <p>Seems to be mass punishment for individual infraction</p> <p>As a taxpayer, I want to buy stuff, not paperwork</p>

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
C 5	Program manager Contracts Contract management (additional) -----	CAS Cost and Pricing data Payments	Bureaucracy Number of rules, regulations, MILSPECS Oversight process and 'attempts' at oversight Huge bureaucracy set up with numerous agencies (DCAA, DPROs, etc.) set up to use FAR, can't cope to operating in a commercial environment The contractor is forced to prove commercial practices.	Within an agency is good Varies by agency substantia lly Each has 'pet' clauses	One mistake generates new policy or regulations DCAA is an enemy to change--puts them out of a job
D 1	Contract Don't co- mingle assets by contract -----	Total system procurement responsibilit y (TSPP) Cradle to grave - can't predict costs Correction of deficiencies Government approval of personnel (big contracts)	CAS	Fairly uniform with FAR clauses Each agency has its own requiremen ts but generally uniform Varies by individual	Procurement cycle FFP development Timely response to proposals

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
E 1	<p>Same except for sales</p> <p>-----</p> <p>Needs of commercial customer are simpler</p> <p>Separate lines and marketing strategies</p> <p>Tracking requirements are different</p> <p>Personnel are to trained to service either commercial customer or government customer</p>	<p>No problem with clauses in general-- understand the macro view of Government</p> <p>MILSTD and MILSPEC are redundant of FAA</p> <p>Confuse desire with requirement</p> <p>Fair and open competition</p> <p>Superincumben cy</p> <p>Small business set aside (we can't use even though we are a small business)</p>	<p>CAS-- additional resources (manpower and money) required to maintain and monitor</p> <p>Subject to audit</p>	<p>Varies by agency</p> <p>Varies by contractin g officer</p>	<p>2% of desire causes 90% of cost increase</p> <p>Don't get information on why we lose a contract bid</p> <p>Tells how contractor performed, but gives no feedback on how to improve to build on next time</p>
F 1	<p>Work order</p> <p>-----</p> <p>-</p> <p>Regulation</p> <p>Easier</p>	<p>Quality</p> <p>Small business</p> <p>AFOSH</p> <p>Inspection</p>	<p>Inspections</p> <p>No problem with audits</p> <p>Auditors change--have to familiarize with company</p> <p>More interested in self- perpetuation than lowering costs</p>	<p>Same</p> <p>Interpreta tion varies by individual s</p> <p>Agency is consistent</p>	<p>There are few suppliers in this business</p>

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
F 2	Accounting Centers Completion area -----	FAR flow down (Subs don't want any part of it) Cost Inventory Data/definit on to define product beyond practicality	Bureaucracy is self perpetuating	Varies by agency Individual egos can get in way of progress	There is a cost responding to an RFP which is not found in the commercial world US doesn't look to foreign competitors enough--some domestic buys use foreign components
G 1	Project or customer Marketing business development -----	CAS	Inflexibility of changing contract provisions Too rigid Requires too many layers of approval Commercial customer has no inspectors DCAS and DPRO are adversaries when seeking a change	Varies by agency Uniform within agency	Adversarial nature between customer and seller-- especially in the last few years Lack of trust Commercial customer is more of a partner Only one accounting and cost collection structure

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
H 1	Accounting Process ----- Required by contract	Accounting adds cost to overhead or direct cost Can't spill to commercial Small contract has way too many FAR/DFARS clauses required to make worth the effort to pursue		Appear to standardiz e with no thought to what the real requiremen ts are	CAS costs passed on to customer Don't look at individual clauses to determine if a clause is necessary Standard accounting for commercial Job lot process for government Not segregated for a commercial sale to government
I 1	Work order Accumulate costs separately ----- CAS Don't know if losing or making money if not segregated	CAS - always in disagreement with DCAA Recoupment Liquidated damages Data rights	CAS no problem one you have it It's hard to become compliant	No big variance in interpreta tion Varies by Agency Uniform in terms of required clauses	

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
I 2	Government work program office Most Groups support both commercial and government ----- - Don't know	Any that go beyond FAA requirements	Additional inspections beyond FAA Flight readiness review	Different agencies focus on different areas	Some mission requirements make OTS impractical. Should look at these mission requirements before eliminating an aircraft from consideratio n. We have to train military with FAA certificatio n.

** Company/Respondent Number

TABLE 5 (CONT'D)
DIFFICULTIES CONTRACTING WITH GOVERNMENT

**	Segregation of Markets ----- -- Reason	Onerous Clauses	Bureaucracy and Oversight	Uniformity among Government Agencies	Other
J 1	<p>Work Order -----</p> <p>To adequately account for government portion of development</p> <p>CAS</p> <p>Accounting for government furnished property</p>	<p>TINA</p> <p>CAS</p> <p>Foreign Corrupt Practices Act</p> <p>International Trade in Arms Regulation</p> <p>Fraud, waste, and Abuse</p> <p>Changes Clause</p> <p>Termination for Default</p> <p>DCAA Cost Analysis</p> <p>Inspection</p> <p>Work Measurement</p> <p>Small Business/ Small Disadvantaged Business Subcontractin g</p>	<p>MILSTD 1567A Work measurement</p> <p>Program monitoring costs such as periodic data submittal</p> <p>Various audits - CORs, PARs, Safety, environmental , should cost, program reviews, etc</p> <p>DCAA</p> <p>Various IGs</p> <p>Security</p> <p>DPRO</p> <p>Buying agency</p> <p>DLA</p>	<p>Not consistent or uniform between Government agencies as evidenced by the various FAR supplement s.</p> <p>Some difference s between contractin g officers</p> <p>Different philosophy between Air Force and Navy and applicatio n of clauses</p>	<p>Commercial is any sale to other than US Government (including foreign government sales)</p>
K 1					

** Company/Respondent Number

TABLE 6
CONTRACTOR RECOMMENDATIONS

**	Specifications and Clauses	Payments	CAS	Other
A 1	<p>State the requirements, not the solution</p> <p>Let contractor assume liability</p>			<p>Allow more discussions in RFP process</p> <p>Procurement integrity</p> <p>Remove adversarial nature.</p>
A 2		Electronic funds transfer		<p>Streamline the acquisition organization. Too many people with veto authority.</p> <p>Reduce oversight in the plant.</p> <p>Quit.</p>
A 3	Use the UCC as opposed to MILSPECS.	In accordance with standard commercial terms.	Commercial product bought FFP shouldn't even need cost data.	<p>Need a stand alone statute covering commercial products. No other statutes/rules would apply.</p> <p>Suppliers are part of the commercial product.</p> <p>Don't care how you go to commercial practices. We just want to use a commercial contract.</p>

** Company/Respondent Number

**TABLE 6 (CONT'D)
CONTRACTOR RECOMMENDATIONS**

**	Specifications and Clauses	Payments	CAS	Other
B 1		<p>Use what the manufacturer in normal operations.</p> <p>Eliminate paper shuffling.</p> <p>Become more business like.</p>	<p>Tailor the use to what is being procured.</p>	<p>Eliminate duplication of FAA requirements.</p> <p>Change policy to encourage competition. Contractors don't want, or are afraid to enter contracts with the government.</p> <p>Hire and train customer oriented personnel. Fire 'do nothing' bureaucrats.</p>
C 1				<p>Put myself in the best position to acquire products in the right market conditions. (i.e. get money approval, etc., then look for the best deal--low price may be only for a short time.)</p> <p>Follow up on acquisition 2-3 years after the fact to see how it went. Recommend improvements or changes as to what we should have done.</p> <p>Use the UCC more.</p>

** Company/Respondent Number

TABLE 6 (CONT'D)
CONTRACTOR RECOMMENDATIONS

**	Specifications and Clauses	Payments	CAS	Other
C 2		Net 10 days		<p>Separate section in the FAR for commercial acquisition.</p> <p>Reduce the waiver process.</p> <p>Design commerciality into the RFP and SRD.</p> <p>Make commerciality determination easier.</p> <p>Relax functional configuration and physical configuration audits.</p> <p>Continue improving the process.</p>

** Company/Respondent Number

**TABLE 6 (CONT'D)
CONTRACTOR RECOMMENDATIONS**

**	Specifications and Clauses	Payments	CAS	Other
C 3			Don't require it	<p>Get industry and military together and divide into contractor and technical issues.</p> <p>Issue contracting policy on commercial practices to give authority to contracting officers without changes, deviation, or waivers.</p> <p>Section in FAR or DFAR for commercial practices with commercial products.</p> <p>Class on commercial practices at DSMC/AFIT</p> <p>Appoint a commerciality advocate to see if an acquisition can be done commercially.</p> <p>Use common sense.</p>

** Company/Respondent Number

TABLE 6 (CONT'D)
CONTRACTOR RECOMMENDATIONS

**	Specifications and Clauses	Payments	CAS	Other
C 4		Commercial payments practices		<p>Decision makers need to look at studies from special groups.</p> <p>Reduce the number of decision makers.</p> <p>Change mindset of the system--culture of military industrial organization</p> <p>Make section for commercial practices in non-competitive situation (DFARS 211 only address competitive)</p> <p>Regulations addressing commercial elements.</p> <p>Class on how to procure commercially.</p>
C 5		Allow PCO to use standard commercial payment practices. Make part of the FAR		<p>Change jobs. No matter what you do, some group would object.</p> <p>Adopt commercial practices. Look at NDIs. Take advantage of what's in place.</p>

** Company/Respondent Number

**TABLE 6 (CONT'D)
CONTRACTOR RECOMMENDATIONS**

**	Specifications and Clauses	Payments	CAS	Other
D 1	Establish minimal essential requirements in lieu of agency specific	Pay monthly progress within 15 days on major contracts. Milestone payments on case by case basis.	No new standard. Less oversight. More self-audit.	Tailor FAR to enable use of sound commercial practices. Take advantage of what is already developed. Establish policy to establish teamwork. Get rid of adversarial nature. Adopt recommendations of CAID study. Give program manager authority to buy without FAR/DFARS requirements.
E 1	Cost/benefit analysis before imposing costly items. Mission need statement should have realism in the entire requirements and authorization process.	Streamline payments. Audits should come after the fact. Train auditors better.	Better training of auditors.	For follow-on contracts, give the contract to the incumbent or level start-up costs for competitors. More discussion between contracting officer and contract during RFP process. Make acquisition a career field (similar to pilots). Stay in field for a period of time. Give equal opportunity for promotion. Top managers should 'grow up' in the career field. Get away from fixed price R&D contracts. Term limits in House and Senate to get away from special interests.

** Company/Respondent Number

TABLE 6 (CONT'D)
CONTRACTOR RECOMMENDATIONS

**	Specifications and Clauses	Payments	CAS	Other
F 1	<p>Use FAA requirements vs. MILSPECS</p> <p>Remove MILSPEC where commercial standards exist.</p> <p>Review clauses 'boilerplates' before negotiations.</p> <p>Show consideration for what products are, what clauses should apply, and supplier base.</p>	Use standard commercial invoice.	Use GAAP.	Use all competitive practices where possible.
F 2		Timely payments.		Make simpler to respond to requirement for purchase.
G 1	<p>Give contractor more leeway.</p> <p>Interpretation should be tailored to end use.</p>	More flexibility with respect to cost of money.	<p>Eliminate.</p> <p>Go to market price.</p>	<p>Tailor to commercial practice where possible.</p> <p>Less oversight. More trust.</p> <p>Simplify procurement system. Takes too long for proposal, fact finding, negotiations, lack of trust, and second guessing.</p> <p>More friendly business relationship between contractor and government. More trust--less adversarial.</p>

** Company/Respondent Number

TABLE 6 (CONT'D)
CONTRACTOR RECOMMENDATIONS

**	Specifications and Clauses	Payments	CAS	Other
H 1	<p>Don't use.</p> <p>Use firm fixed price.</p> <p>Use commercial price.</p> <p>Use commercial description.</p>	<p>Milestone - based on specific identifiable action.</p>	<p>Just use GAAP and FASB.</p>	<p>Trust supplier.</p> <p>Sort procurement into two categories - (1) 100% commercial for risk-free buys and (2) totally unique war machines with no commercial market.</p> <p>Use commercial practices as much as possible.</p>
I 1	<p>Use as a guide to eliminate an interpretation battle.</p>	<p>Milestone payments</p> <p>Same as commercial</p>	<p>Don't require for competitive procurement.</p>	<p>More realistic delivery schedules.</p> <p>Eliminate flow down of clauses.</p> <p>Delete work measurement standards.</p> <p>Delete cost reporting requirements.</p>
I 2	<p>Need to use commercially approved inspections and MRB.</p> <p>Eliminate all areas of duplication of FAA certification requirements.</p>			<p>Simplify RFQ response and time constraints on responding.</p> <p>Just inspect, test, or certify those changes to the product not certified by FAA.</p>

** Company/Respondent Number

TABLE 6 (CONT'D)
CONTRACTOR RECOMMENDATIONS

**	Specifications and Clauses	Payments	CAS	Other
J 1	Those normally employed in commercial contracts	<p>90% standard progress payments with flex</p> <p>Payment within 10 days of invoice or DD 250</p> <p>Use commercial payment practices.</p>	<p>Make more flexible and equally fair to both parties.</p> <p>Eliminate.</p>	<p>Practice what is being preached.</p> <p>Change the regulatory requirements as necessary and implement existing available commercial practices.</p> <p>Eliminate all FAR supplements. Forces all organizations to use the same set of rules without modification.</p> <p>Implement commercial practices now available.</p> <p>Restructure contract.</p> <p>Use commercial warranty.</p> <p>Reduce the degree of government oversight.</p>
K 1	<p>Simplify.</p> <p>Use the same terms as the commercial world.</p>			

** Company/Respondent Number

TABLE 7
BENEFITS OF COMMERCIAL PRACTICES

**	Contractor	Government	Other comments
A 1	Lower costs No loss of quality	Lower costs No loss of quality	
A 2	Economy of operations Lower costs No sacrifice of quality	Lower costs No sacrifice of quality	
A 3	Substantial cost savings Better Delivery External testing provides improved quality.	Lower costs.	Process is criminalized - we don't work out problems together,. We are forced to go to court and litigate rather than negotiate. Socioeconomic clauses can't always be abided by. Supplies are bought or contracted in advance in large lots to keep costs down. You can't do commercial business with the DOD on an exception basis. Can't do changes under the current system and make it work. Must wipe the slate clean and start over in regards to commercial products.
B 1	More business	Lower costs Increased competition High quality	The government manages numerous personnel with rules. These people can all make up their own interpretations.
C 1	Less corporate administrative costs levied by regulations, requirements, etc.		

** Company/Respondent Number

TABLE 7 (CONT'D)
BENEFITS OF COMMERCIAL PRACTICES

**	Contractor	Government	Other comments
C 2			
C 3	Increased sale	Savings	
C 4	Increased supplier base	Lower costs. No loss of quality	
C 5			If you reduce things to the lowest common denominator, you'll find something, somewhere that will preclude commerciality.
D 1	Less oversight Less bureaucracy	Lower costs	
E 1	Simplified paperwork.	Streamlined process. Get product faster. Gives contractor incentives for capital investment.	Give information on how and why we lost a contract. Told how we performed, but get no feedback on how to improve the next time.
F 1	Lower administrative costs. Fewer audits. Less interpretation items.	Lower costs.	Competing reduces MILSPEC requirements.
F 2	Less paperwork Lower costs Less overhead	Lower purchase price More competition	Government doesn't look to foreign competitors enough. Some 'domestic' buys use foreign components extensively.

** Company/Respondent Number

**TABLE 7 (CONT'D)
BENEFITS OF COMMERCIAL PRACTICES**

**	Contractor	Government	Other comments
G 1		Lower acquisition cost Better products More responsiveness.	
H 1	Get to use existing practices in engineering, costing, etc. No quality risk. Cost savings.	Increased quality because it's easier to change suppliers. More competition.	
I 1	More realistic schedules. Quicker change approvals. More competitive.	Lower costs.	
I 2	Simplified contracts. Lower cost to bid. Better schedule.	Lower costs. Better schedule.	Mission requirements make OTS impractical. Should look at these mission requirements before eliminating aircraft from consideration. Train military with FAA certification so they understand what it entails. If you buy commercial, go with commercial support.
J 1	Significant reduction in overhead and direct operating costs. Increased sales. More profit.	Lower costs.	
K 1	Would make communication easier.		

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VITA

Captain Doug Humerick was born on 25 Aug 1964 in Ranson, West Virginia. He attended the University of Maryland, receiving the degree of Bachelor of Science in Computer Science in May 1986. He was commissioned in the Air Force through the Air Force Reserve Officer's Training Corps in May 1986. Upon commissioning, he was stationed at Grand Forks Air Force Base, North Dakota where he held positions as Assistant Chief, Operations Scheduling Branch, Senior Minuteman ICBM Combat Crew Commander, and Minuteman ICBM Instructor Combat Crew Deputy. While serving as a missileer, he received a Master of Business Administration degree from the University of North Dakota. He attended and graduated from Squadron Officer's School en route to his current position. Captain Humerick is currently enrolled as a student in the School of Contracting Management, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio.

Captain Humerick is married to the former Lisa Lakin of Jefferson, Maryland. They have two sons, Zachary, 4, and Jacob, 23 months. They currently reside in Fairborn, Ohio.

Permanent Address: 705 Tritapoe Dr.
Knoxville, MD 21758

Steven H. Minnich was born on 14 March 1961 in Troy, Ohio. He graduated from Marion Harding High School in Marion, Ohio in 1979 and attended Bowling Green State University, graduating with a Bachelor of Science in Industrial Labor Relations in May 1983. An Air Force ROTC scholarship recipient he completed training and was commissioned upon graduation. He entered active duty in September 1983 at MacDill AFB, Florida as a Contracting Officer. Upon completion of training he was assigned as the Branch Chief of Specialized Contracting Branch supporting Central Command and Readiness Command and then Branch Chief of Supplies Contracting Branch supporting the 56th Tactical Training Wing. While serving in these capacities he completed a Master of Public Administration Degree, Human Resource Management through Golden Gate University in June 1985. In August 1985 he was assigned to the 3440th Contracts Training Squadron, 3400th Training Group, Lowry AFB, Colorado as instructor of the Base Level Contracting Officer's Course. His duties expanded to include instructing Utilities, Base Level Pricing, Contract Law and Systems Level Contracting and was assigned as the instructor supervisor. In 1988, he was assigned to Air Force ROTC Detachment 600, East Carolina University, Greenville, North Carolina as Assistant Professor of Aerospace Studies teaching management leadership and communication skills. He held this position until entering the School of Systems and Logistics, Air Force Institute of Technology, in May 1991.

Captain Minnich is married to the former Debbie Lucas of North Olmsted, Ohio. They have a son Richard, 3, and a daughter Amy, 8 months.

Permanent Address: 109 Villa Drive
New Carlisle, Ohio 45344

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3. The benefits of AFIT research can often be expressed by the equivalent value that your agency received by virtue of AFIT performing the research. Please estimate what this research would have cost in terms of manpower and/or dollars if it had been accomplished under contract or if it had been done in-house.

Man Years _____ \$ _____

4. Often it is not possible to attach equivalent dollar values to research, although the results of the research may, in fact, be important. Whether or not you were able to establish an equivalent value for this research (3. above) what is your estimate of its significance?

a. Highly
Significant

b. Significant

c. Slightly
Significant

d. Of No
Significance

5. Comments

Name and Grade

Organization

Position or Title

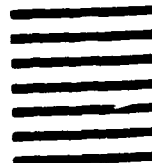
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